SEQUENCE LISTING

<110> Mengeling, William L

Vorwald, Ann

Lager, Kelly

Roof, Mike

Burkhart, Kelly

Gorcyca, David

<120> PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VACCINE BASED ON ISOLATE JA-142

<130> 27093B

<160> 4

<170> PatentIn version 3.1

<210> 1
<211> 15424
<212> DNA
<213> Porcine reproductive and respiratory syndrome virus

<400> 1
```
tcgcccgggc aggtgttggc tctatgcctt ggcatttgta ttgtcaggag ctgcgaccat      60
tggcacagcc caaaactagc tgcacagaaa acgcccttct gtgacagccc tcttcagggg     120
agcttagggg tctgtcccta gcaccttgct tccggagttg cactgcttta cggtctctcc     180
aaccctttaa ccatgtctgg gatacttgat cggtgcacgt gcaccccaa tgccagggtg     240
tttatggcgg agggccaagt ctactgcaca cgatgtctca gtgcacggtc tctccttcct     300
ctgaatctcc aagttcctga gcttggagtg ctgggcctat tttacaggcc cgaagagcca     360
ctccggtgga cgttgccacg tgcattcccc actgttgagt gctcccccgc cggggcctgc     420
tggctttctg cgatctttcc aattgcacga atgaccagtg aaacctgaa  ctttcaacaa     480
agaatggtgc gggtcgcagc tgagatttac agagccggcc agctcacccc tgcagtcttg     540
```

Page 1

```
aaggctctac aagtttatga acggggttgc cgctggtacc ctatagtcgg acctgtccct    600

ggagtggccg attttgccaa ctccctacat gtgagtgata aacctttccc gggagcaact    660

catgtgctaa ccaacctgcc actcccagag aggcctaagc ctgaagactt ttgcccttct    720

gagtgtgcta tggctgacgt ctatgatatt ggccatggcg ccgtcatgta tgtggccaaa    780

gggaaagtct cctgggcccc tcgtggcggg gatgaggcga aatttgaacc tgtccctagg    840

gagttgaagt tgatcgcgaa ccaactccac atctccttcc cgccccacca cgcagtggac    900

atgtctaagt ttgtgttcat agcccctggg agtggtgtct ctatgcgggt cgagtgccca    960

cacggctgtc tccccgctaa tactgtccct gaaggtaact gctggtggcg cttgtttgac   1020

tcgctcccac tggacgttca gaacaaagaa attcgccgtg ccaaccaatt cggctatcaa   1080

accaagcatg gtgtcgctgg caagtaccta caacggaggc tgcaagctaa tggtctccga   1140

gcagtgactg atacagatgg acccattgtc gtacagtatt tctctgttag ggagagctgg   1200

atccgccact tcagactggc ggaagagcct agcctccctg ggtttgaaga cctcctcaga   1260

ataagggtag agcccaatac gtcgccattg agtgacaagg gtggaaaaat cttccggttt   1320

ggcagtcaca aatggtacgg tgctggaaag agagcaagga aagcacgctc tggtatgacc   1380

accacagtcg ctcaccgcgc cttgcccgct cgtgaaatcc agcaagccaa aaagcacgag   1440

gatgccggcg ctgataaggc tgtgcatctc aggcactatt ctccgcctgc cgacgggaac   1500

tgtggttggc actgcatttc cgccatcgcc aaccgaatgg tgaattccaa atttgaaact   1560

actcttcccg agagggtgag accttcagat gactgggcta ctgacgagga ccttgtgaac   1620

accatccaaa ttctcaagct ccctgcggcc ttggacagga acggtgcttg tgttggcgcc   1680

aaatacgtgc ttaagctgga aggcgagcat tggactgtct ctgtgaccct tgggatgtcc   1740

ccttctttgc tcccccttga atgtgttcag ggctgttgtg agcataagag cggacttggt   1800

cccccagatg cggtcgaagt tttcggattt gaccctgcct gccttgaccg actggctgag   1860

gtaatgcact tgcctagcag tgtcatccca gctgctctgg ccgaaatgtc cggcgacccc   1920

aaccgtccgg cttccccggt cactactgtg tggactgttt cacaattctt tgcccgccac   1980

agaggaggag agcaccctga tcaggtgcgc ttaggaaaaa tcatcagcct tgtcaagtt    2040

gttgaggaat gctgttgcca tcagaataaa accaaccggg ccaccccgga agaggttgcg   2100

gcaaggattg atcagtacct ccatggtgca acaagtcttg aagaatgctt gattaggctt   2160

gagagggttt gcccgccgag cgctgcggac accttctttg attggaatgt tgtgctccct   2220

ggggttgggg cttcaactca gacaaccaaa cagctccatg tcaaccagtg ccgcgctctg   2280

gttcctgtcg tgactcaaga gcctttggac aaagacccag tccctctgac cgccttctcg   2340

ctgtccaatt gctactatcc tgcacaaggt gacgaggttc gtcaccgtga gaggctaaac   2400

tccgtactct ctaagctgga ggggggttgtt cgtgaggaat atgggctcac gccaactgga   2460
```

Page 2

```
cctggccccgc gacccgcact accgaacggg ctcgtcgaac ttaaagacca gatggaggag   2520

gatctgctaa aactagtcaa cgcccaggca acttcagaaa tgatggcctg ggcagccgag   2580

caggttgatc tgaaagcttg ggtcaaaaac tacccacggt ggacaccgtc accccctcca   2640

ccaagagttc agcctcgaaa aacaaagcct gtcaagagct tgccagggaa caaacctgtc   2700

cccgctccac gcaggaaggt cagatctgat tgtggcagcc cgatttcgat gggcgacaat   2760

gttcctgacg gtcgggaaga tttgactgtt ggtggccccc ttgatctttc gacaccatcc   2820

gagccgatga cacctctgag tgagcctgca cctatgcccg cgttgcaata tatttctagg   2880

ccagtgacac ctttgagtgt gctggcccca gtacctgcac cgcgtagaac tgtgtcccga   2940

ccggtgacgc ccttgagtga gccaattttt gtgtctgcac cgcgacacaa atttcagcag   3000

gtggaagaag cgaatctggc ggcaacaatg ctgacgcacc aggacgaacc tctagatttg   3060

tctgcatcct cacagactga atatgaggct ctcccctaa caccactgca gaacatgggt    3120

attctggagg tggggggggca agaagctgag gaagttctga gtgaaaactc ggatacactg   3180

aatgacatca accctgcacc tgtgtcatca agcagctccc tgtcaagtgt taagatcaca   3240

cgcccaaaac actctgctca agccatcatt gactcgggcg ggccctgcag tgggcatctc   3300

cgaaagggaa aagaagcatg cctcagcatc atgcgtgagg cttgtgatgc ggctaagctt   3360

agtgaccctg ccacgcagga atggctttct cgcatgtggg atagggttga tatgctgact   3420

tggcgcaaca cgtctgctta ccaggcgttc cgcatcttag atggtaggtt tgagtttctc   3480

ccaaagatga tactcgagac accgccgccc tacccgtgtg ggtttgtgat gctgcctcgc   3540

acgcctgcac cttccgtggg tgcagagagt gaccttacca ttggttcagt cgccactgaa   3600

gatgttccac gcatcctcgg gaaaatagaa aacgccggca agatgcccaa ccaggggctc   3660

ttgacatcct tcggggaaga accggtgtgc gaccaacctg tcaaggactc ctggatgtcg   3720

tcgcgggggt ttgacgagag cacaacggct ccgtccgctg gtacaggtgg tgctgactta   3780

cccaccgatt tgccaccttc agatggtttg gatgcggacg agtgggggcc gttacggacg   3840

gtaagaaaga aagctgaaag gctcttcgac caattgagcc gtcaggtttt taacctcgtc   3900

tcccatctcc ctgttttctt ctcacacctc ttcaaatctg acagtggtta ttctccgggt   3960

gattggggtt ttgcagcttt tactttattt tgcctctttt tgtgttacag ctacccattc   4020

tttggttttg ttcccctctt gggtgttttt tctgggtctt ctcggcgtgt gcgcatgggg   4080

gtttttggct gttggttggc ttttgctgtt ggcctgttca agcctgtgtc cgacccagtc   4140

ggcactgctt gtgagtttga ctcgccagag tgtaggaacg tccttcattc tttttgagctt   4200

ctcaaacctt gggaccctgt tcgcagcctt gttgtgggcc ccgtcggtct cggccttgcc   4260

attcttggca ggttactggg cggggcacgc tacatctggc attttttgct taggcttggc   4320
```

```
attgttgcag attgtatctt ggctggagct tatgtgcttt ctcaaggtag gtgtaaaaag    4380

tgctggggat cttgtgtaag aactgctcct aatgaaatcg ccttcaacgt gttccctttt    4440

acgcgtgcga ccaggtcgtc actcatcgac ctgtgcgatc ggttttgtgc gccaaaaggc    4500

atggacccca ttttcctcgc tactgggtgg cgcgggtgct ggaacggccg aagtcccatt    4560

gagcaaccct ctgaaaaacc catcgcgttc gcccagttgg atgaaaagag gatcacggct    4620

agaactgtgg tcgctcagcc ttatgatcct aaccaagccg taaagtgctt gcgggtgtta    4680

caggcgggtg gggcgatagt ggccgaggca gtcccaaaag tggtcaaggt ttccgctatt    4740

ccattccgag ctcccttttt tcccaccgga gtgaaggttg atcctgagtg caggatcgtg    4800

gtcgaccccg acacttttac tacagctctc cggtctggtt actccaccac aaacctcgtc    4860

cttggtgtag gggactttgc ccaactgaat ggattaaaaa tcaggcaaat ttccaagccc    4920

tcgggaggag gcccgcacct cattgctgcc ctgcatgttg cttgctcgat ggcgttgcac    4980

atgcttgctg gagtttatgt aactgcagtg gggtcttgcg gtaccggcac caacgatccg    5040

tggtgcacta acccattcgc cgtccctggc tacggacctg gctccctctg cacgtccaga    5100

ttgtgcatct cccaacatgg ccttaccctg cccttgacag cacttgtggc aggattcggt    5160

cttcaggaaa ttgccctagt cgttttgatt ttcgtttcca tcggaggcat ggctcatagg    5220

ttgagttgta aggctgatat gctgtgcgtc ttacttgcaa tcgccagcta tgtttgggta    5280

ccccttacct ggttgctctg tgtgtttcct tgctggttgc gctggttctc tttgcaccct    5340

ctcaccattc tatggttggt gtttttcttg atgtctgtaa atatgccttc gggaatctta    5400

accgtggtgt tattggttgc tctttggctt ctaggccgtt atactaatgt tgttggtctt    5460

gttaccccct atgatattca ccattacacc aatggccccc gcggtgttgc cgccttggct    5520

accgcaccag atgggactta cttggccgct gtccgccgcg ctgcgttgac tggccgcacc    5580

gtgctgtttta ccccgtctca gcttgggtcc cttcttgagg gcgctttcag aactcgaaag    5640

ccctcactga acaccgtcaa tgtggtcggg tcctccatgg gctctggcgg agtgttcact    5700

atcgatggga aaattaagtg cgtgactgcc gcacatgtcc ttacgggtaa ttcagccagg    5760

gtttccgggg tcggctttaa tcaaatgctt gactttgatg taaaaggggga cttcgccata    5820

gctgactgcc cgaattggca aggggctgct cctaagaccc aattctgcga ggatggatgg    5880

actggccgcg cctattggct gacatcctct ggcgtcgaac ccggtgtcat tgggaatgga    5940

ttcgccttct gcttcaccgc gtgcggcgat tccgggtccc cagtgatcac cgaagccggt    6000

gagcttgtcg gcgttcacac aggatcaaac aaacaaggag gaggcattgt tacgcgcccc    6060

tctggccagt tttgcaatgt ggcacccatc aagctgagcg aattaagtga gttctttgct    6120

ggacctaagg tcccgctcgg tgatgtgaag gttggcagcc acataattaa agacatatgc    6180

gaggtacctt cagatctttg cgccttgctt gctgccaaac ccgaactgga aggaggcctc    6240
```
Page 4

```
tccaccgtcc aacttctgtg tgtgttttc ctcctgtgga gaatgatggg acatgcctgg    6300

acgcccttgg ttgctgttgg gttttttatc ttgaatgagg ttctcccagc tgtactggtc    6360

cggagtgttt tctcctttgg aatgtttgtg ctatcttggc tcacaccatg gtctgcgcaa    6420

gttctgatga tcaggcttct aacagcagct cttaacagga acagattgtc actcgccttt    6480

tacagccttg gtgcagcgac cggttttgtc gcagatctgg cggcaactca agggcacccg    6540

ttgcaggcag taatgaattt aagtacctat gccttcctgc ctcggataat ggtcgtgacc    6600

tcaccagtcc cagtgattgc gtgtggtgtt gtgcacctcc ttgccataat tttgtacttg    6660

tttaagtacc gctgcctgca caatgtcctt gttggcgatg gtgcgttctc tgcggctttc    6720

ttcttgcgat actttgccga ggggaaattg agggaagggg tgtcgcaatc ctgcgggatg    6780

aatcatgagt cgctgactgg tgccctcgct atgagactta atgacgagga cttggatttt    6840

cttacgaaat ggactgattt taagtgtttt gtttctgcat ccaacatgag gaatgcggcg    6900

ggccagttca tcgaggctgc ctatgctaaa gcacttagaa ttgaacttgc ccagttggtg    6960

caggttgata aggttcgagg tactttggcc aaacttgaag cttttgctga taccgtggca    7020

ccccaactct cgcccggtga cattgttgtt gctcttggcc atacgcctgt tggcggtatc    7080

ttcgacctaa aggttggtag caccaagcat accctccaag ccattgagac cagagttctt    7140

gccgggtcca aaatgaccgt ggcgcgtgtc gttgatccaa cccccacacc cccacccgca    7200

cccgtgccta tccccttcc accgaaagtt ctggagaatg gtcccaacgc ctggggggat    7260

gaggatcgtt tgaataagaa gaagaggcgc aagatggaag ccgtcggcat ctttgttatg    7320

ggtggaaaga aatatcagaa attttgggac aagaactccg gtgatgtgtt ttatgaggag    7380

gtccatgata acacagacgc gtgggagtgc ctcagagttg acaaccctgc cgactttgac    7440

cctgagaagg gaactctgtg cgggcatact accattgaag ataagactta cagtgtctac    7500

gcctccccat ctggcaagaa attcctggtc cccgcctacc cagagagcaa aaaaaaccaa    7560

tgggaagctg cgaagctttc cgtggaacag gcccttggca tgatgaatgt cgacggtgaa    7620

ctgacagcca aagaagtgga gaaactgaaa agaataattg acaaactcca gggcctgact    7680

aaggagcagt gtttaaactg ctagccgcca gcggcttgac ccgctgtggt cgcggcggct    7740

tggttattac tgagacagcg gtaaaaatag tcaaatttca caaccggacc ttcaccctag    7800

gacctgtgaa tttaaaagtg gccagtgagg ttgagctaaa agacgcggtc gagcataacc    7860

aacacccggt tgcaagaccg gttgatggtg gtgttgtgct cctgcgctcc gcagttcctt    7920

cgcttataga cgtcttaatc tccggcgctg atgcatctcc caagttactc gcccgccacg    7980

ggccgggaaa cactgggatc gatggcacgc tttgggattt tgaggccgag gccactaaag    8040

aggaaattgc actcagtgcg caaataatac aggcttgtga cattaggcgc ggcgacgcac    8100
```

Page 5

```
ctgaaattgg tcttccttat aagctgtacc ctgtcagggg caaccctgag cgggtaaaag   8160

gagttttaca gaatacaagg tttggagata taccttataa aaccccagt gacactggaa    8220

gcccagtgca cgcggctgcc tgcctcacgc ccaatgccac tccggtgact gatgggcgct   8280

ccgtcttggc cacgactatg ccctccggtt ttgagttgta tgtaccgacc attccagcgt   8340

ctgtccttga ttatcttgat tctaggcctg actgccccaa acagttgaca gagcacggct   8400

gtgaggacgc cgcattaaga gacctctcca agtatgactt gtccacccaa ggctttgttt   8460

tacctggagt tcttcgcctt gtgcgtaagt acctgtttgc tcatgtgggt aagtgcccgc   8520

ccgttcatcg gccttccact taccctgcca agaattctat ggctggaata aatgggaaca   8580

ggtttccaac caaggacatc cagagcgtcc ctgaaatcga cgttctgtgc gcacaggccg   8640

ttcgggaaaa ctggcaaact gttacccctt gtaccctcaa gaaacagtat tgtgggaaga   8700

agaagactag gacaatactc ggcaccaata acttcattgc gctggctcac cgggcagcgt   8760

tgagtggtgt cacccagggc ttcatgaaaa aggcgtttaa ctcgcccatt gccctcggta   8820

aaaacaaatt taaagagctt cagactccgg tcttaggcag gtgccttgaa gctgatcttg   8880

catcctgcga tcgctccaca cctgcaattg tccgctggtt tgccgccaat cttctttatg   8940

aacttgcctg tgctgaagag caccagccgt cgtacgtgtt gaactgctgc cacgacctac   9000

tggtcacgca gtccggcgca gtaactaaga gaggtggcct gtcgtctggc gacccgatca   9060

cttctgtgtc caacaccatt tacagcttgg tgatatatgc acaacacatg gtgctcagtt   9120

actttaaaag tggtcaccct catggccttc tgtttctaca agaccagctg aagtttgagg   9180

acatgctcaa ggttcaaccc ctgatcgtct attcggacga cctcgtactg tatgccgagt   9240

ctcccaccat gccaaactac cactggtggg ttgaacatct gaacctgatg ctgggttttc   9300

agacggaccc aaagaagaca gccataacag actcgccatc atttctaggc tgtaggataa   9360

taaatggacg ccagctcgtc cctaaccgtg acaggattct cgcggccctc gcctaccata   9420

tgaaggcaag caatgtctct gaatactacg cctcggcggc tgcgatactc atggacagct   9480

gtgcttgttt agagtatgat cccgaatggt ttgaagagct tgtagttggg atagcgcagt   9540

gtgcccgcaa ggacggctac agttttcccg gcccgccgtt cttcttgtcc atgtgggaaa   9600

aactcagatc caatcatgag gggaagaagt ccagaatgtg cgggtactgc ggggccccgg   9660

ctccgtacgc cactgcctgt ggcctcgacg tctgtattta ccacacccac ttccaccagc   9720

attgtccagt catcatctgg tgtggccacc cggctggttc tggttcttgt agtgagtgca   9780

aacccccct agggaaaggc acaagccctc tagatgaggt gttagaacaa gtcccgtata   9840

agcctccacg gactgtaatc atgcatgtgg agcagggtct caccctctt gacccaggca    9900

gataccagac tcgccgcgga ttagtctccg ttaggcgtgg cattagagga aatgaggttg   9960

atctaccaga cggtgattat gctagcaccg ccctactccc tacttgtaaa gagattaaca  10020
```
Page 6

```
tggtcgctgt cgcctctaat gtgttgcgca gcaggttcat catcggcccg cctggtgctg   10080

ggaaaacata ctggctcctt caacaggtcc aggatggtga tgccatttac acgccaactc   10140

accagaccat gctcgatatg attagggctt tggggacgtg ccggttcaac gtcccagcag   10200

gtacgacgct gcaattccct gcccctccc gtaccggccc ttgggttcgc atcctagccg    10260

gcggttggtg tcctggcaag aattccttcc tggatgaagc agcgtattgt aatcaccttg   10320

atgtcttgag gcttcttagc aaaactaccc tcacctgtct gggagatttc aaacaactcc    10380

acccagtggg ttttgattct cattgctatg tttttgacat catgcctcag actcaactga   10440

agaccatctg gagatttgga cagaatatct gtgaggccat tcagccagat tacagggaca   10500

aacttgtatc catggtcaac acaacccgtg taacctacgt ggaaaaacct gtcaagtatg   10560

ggcaagtcct cacccctt ac cacagggacc gagaggacgg cgccatcaca attgactcca   10620

gtcaaggcgc cacatttgat gtggttacac tgcatttgcc cactaaagat tcactcaaca   10680

ggcaaagagc ccttgttgct attaccaggg caagacatgc tgtctttgtg tatgacccac   10740

acaggcaact gcagagcatg tttgatcttc ctgcgaaagg cacacccgtc aacctcgctg   10800

tgcaccgtga cgagcagctg atcgtgctag atagaaataa caaagaatgc acggttgctc   10860

aggctctagg caatggggat aaattcaggg ccacagacaa gcgcgttgta gattctctcc   10920

gcgccatttg tgcagatctg gaagggtcga gctccccgct ccccaaggtc gcacacaact   10980

tgggatttta tttctcgcct gatttgacac agtttgctaa actcccggta gaacttgcac   11040

cccactggcc cgtggtgaca acccagaaca atgaaaagtg gccagaccgg ttggttgcta   11100

gccttcgccc cgtccataag tatagccgcg cgtgcatcgg tgccggctac atggtgggcc   11160

cctcagtgtt tctgggcacc cctggggttg tgtcatacta tctcacaaaa tttgtcaggg   11220

gcgaggctca aatgcttccg gagacagtct tcagcaccgg ccgaattgag gtagattgcc   11280

gtgagtatct cgatgaccgg gagcgagaaa ttgctgagtc cctcccccat gctttcattg   11340

gcgacgtcaa aggcactacc gttggaggat gtcaccatgt cacctccaaa taccttccgc   11400

gcttccttcc caaggaatca gtcgcggtag tcggggtttc aagccccggg aaagccgcaa   11460

aagcagtttg cacattaaca gatgtgtatc tcccagatct cgaagcttac ctccacccag   11520

agacccagtc caagtgctgg aaaatgatgt tggacttcaa ggaagttcga ctgatggtct   11580

ggaaggacaa gacggcctat tttcaacttg aaggccgcca tttcacctgg taccagcttg   11640

caagctatgc ctcgtacatc cgagttcctg ttaactctac ggtgtatttg gacccctgca   11700

tgggccctgc cctttgcaac agaagagttg tcgggtccac tcattgggga gctgacctcg   11760

cagtcacccc ttatgattac ggtgccaaaa tcatcctgtc tagtgcatac catggtgaaa   11820

tgccccctgg gtacaaaatc ctggcgtgcg cggagttctc gcttgacgat ccagtgaggt   11880
```

Page 7

```
acaaacacac ctgggggttt gaatcggata cagcgtatct gtacgagttc accggaaacg   11940

gtgaggactg ggaggattac aatgatgcgt ttcgtgcgcg ccagaaaggg aaaatttata   12000

aggccactgc caccagcatg aggtttcatt ttcccccggg ccctgtcatt gaaccaactt   12060

taggcctgaa ttgaaatgaa atggggtcca tgcaaagcct cttttgacaaa attggccaac   12120

ttttcgtgga tgctttcacg gaattttttgg tgtccattgt tgatatcatc atatttttgg   12180

ccattttgtt tggctttacc atcgctggct ggctggtggt cttctgcatc cgattggttt   12240

gctccgcggt actccgtgcg cgccctacca ttcaccctga gcaattacag aagatcctat   12300

gaggcctttc tttctcagtg ccaggtggat attcccacct ggggaactag acatcccctg   12360

gggatgcttt ggcaccataa ggtgtcaacc ctgattgatg aaatggtgtc gcgtcggatg   12420

taccgcacca tggaaaaagc aggacaggct gcctggaaac aggtggtgag cgaggccacg   12480

ctgtctcgca ttagtggttt ggatgtggtg gctcattttc agcatcttgc cgccattgaa   12540

gccgagacct gtaaatattt ggcctctcgg ctgcccatgc tacacaatct gcgcatgaca   12600

gggtcaaatg taaccatagt gtataatagt actttgaatc aggtgtttgc tatttttcca   12660

acccctggat cccggccaaa gcttcatgat tttcagcaat ggctaatagc tgtgcactcc   12720

tccatatttt cctccgttgc ggcttcttgt actctttttg ttgtgctgtg gttgcggatt   12780

ccaatgctac gtactgtttt tggtttccgc tggttagggg caatttttcc ttcgaactca   12840

cggtgaatta cacggtgtgt ccgccttgcc tcacccggca agcagccgct gaggtctacg   12900

aaccaggcag gtctctttgg tgcaggatag ggcatgaccg atgtagtgag gaagaccatg   12960

acgatctagg gttcatggtt ccgtctggcc tctccagcga aggccacttg accagtgttt   13020

acgcctggtt ggcgttcctg tccttcagct acacggccca gttccatccc gagatatttg   13080

ggatagggaa tgtgagtcaa gtttatgttg acatcaagca ccaattcatc tgcgccgttc   13140

acgacgggga gaacgccacc ttgcctcgtc atgacaatat ttcagccgta tatcagacct   13200

actaccaaca tcaagtcgac ggcggcaatt ggtttcacct agaatggctg cgccccttct   13260

tttcctcttg gttggtttta aatgtttctt ggtttctcag gcgttcgcct gcaagccatg   13320

tttcagttca agtctttcgg acatcaaaac caacacaacc gcagcatcag gctttgttgt   13380

cctccaggac atcagctgcc ttaggcatgg cgactcgtcc tctcagacga ttcgcaaaag   13440

ctctcagtgc cgcgcggcga tagggacgcc cgtgtacatc actgtcacag ccaatgtcac   13500

agatgagaat tatttacatt cttctgatct ccttatgctt tcttcttgcc ttttctatgc   13560

ttctgagatg agtgaaaagg gattcaaggt gatgtttggc aatgtgtcag gcatcgtggc   13620

tgtgtgtgtc aactttacca gctacgtcca acatgtcaag gagtttaccc aacgctcctt   13680

ggtggtcgat catgtgcggc tgctccattt catgacacct gagaccatga ggtgggcaac   13740

cgttttagcc tgttttcttg ccatcttact ggcaatttga atgttcaagt atgttggggga   13800
```

```
gatgcttgac cgcgggctgt tgctcgcgat tgctttcttt gtggtgtatc gtgccatttt   13860

gttttgctgc gctcgtcaac gccaacagca acagcagctc tcatcttcag ttaatttaca   13920

acttgacgct atgtgagctg aatggcacag attggctgaa agacaaattt gattgggcat   13980

tggagacttt tgtcatcttt cccgtgttga ctcacattgt ctcatatagt gcactcacca   14040

ctagccattt ccttgacaca gtcggtctgg ttactgtgtc tactgccggg ttctaccacg   14100

ggcggtatgt tctgagtagc atctacgcgg tctgcgctct ggccgcattg acttgcttcg   14160

tcattaggct tgcgaagaac tgcatgtcct ggcgctactc ttgtaccaga tatactaact   14220

tccttctgga cactaagggc agactctatc gctggcggtc gcccgttatc atagagaaag   14280

ggggtaaggt tgaggtcgaa ggtcacctga tcgacctcaa aagagttgtg cttgatggtt   14340

ccgtggcaac ccctttatac agagtttcag cggaacaatg gggtcgtctt tagacgactt   14400

ttgctatgat agcacggctc cacaaaaggt gcttttggcg ttttccatta cctacacgcc   14460

agtgatgata tatgctctaa aggtaagtcg cggccgactt ttagggcttc tgcacctttt   14520

gatctttctg aattgtactt ttaccttcgg gtacatgaca tgcgtgcact ttaatagcac   14580

aaataaggtc gcgctcacta tgggagcagt agttgcactt ctttgggggg tgtactcagc   14640

catagaaacc tggaagttca tcacctccag atgtcgtttg tgcttgctag gccgcaagta   14700

cattctggcc cccgcccacc acgtcgaaag tgccgcgggc tttcatccga tcgcggcaaa   14760

tgataaccac gcatttgtcg tccggcgtcc cggctccact acggttaacg gcacattggt   14820

gcccgggttg aaaagcctcg tgttgggtgg cagaaaagct gttaaacagg gagtggtaaa   14880

ccttgtcaaa tatgccaaat aacaacggca agcagcaaaa gaaaaagagg gggaatggcc   14940

agccagtcaa tcagctgtgc cagatgctgg gtaagatcat cgcccagcaa aaccagtcca   15000

gaggcaaggg accggggaag aaaattaaga ataaaaaccc ggagaagccc cattttcctc   15060

tagcgactga agatgacgtc aggcatcact tcacccctag tgagcggcaa ttgtgtctgt   15120

cgtcgatcca gactgccttt aaccagggcg ctggaacctg taccctatca gattcaggta   15180

ggataagtta cactgtggag tttagtttgc cgacgcatca tactgtgcgc ctgatccgcg   15240

tcacagcgcc atcatcagcg taatgggctg gcattcctta agcacctcag tgttagaatt   15300

ggaagaatgt gtggtgaatg cactgattg gcactgtgcc tctaagtcac ctattcaatt   15360

agggcgaccg tgtggggggtt aagtttaatt ggcgagaacc atgcggccga aattaaaaaa   15420

aaaa                                                                15424
```

<210> 2

<211> 15424

<212> DNA

<213>   Porcine reproductive and respiratory syndrome virus

<400>   2
```
tcgcccgggc aggtgttggc tctatgcctt ggcatttgta ttgtcaggag ctgcgaccat      60

tggtacagcc caaaactagc tgcacagaaa acgcccttct gtgacagccc tcttcagggg     120

agcttagggg tctgtcccta gcaccttgct tccggagttg cactgcttta cggtctctcc     180

aacccttta  ccatgtctgg gatacttgat cggtgcacgt gcaccccaa  tgccagggtg     240

tttatggcgg agggccaagt ctactgcaca cgatgtctca gtgcacggtc tctccttcct     300

ctgaatctcc aagttcctga gcttggagtg ctgggcctat tttacaggcc cgaagagcca     360

ctccggtgga cgttgccacg tgcattcccc actgttgagt gctcccccgc cggggcctgc     420

tggctttctg cgatctttcc aattgcacga atgaccagtg gaaacctgaa cttttcaacaa    480

agaatggtgc gggtcgcagc tgagatttac agagccggcc agctcacccc tgcagtcttg   · 540

aaggctctac aagtttatga cggggttgc  cgctggtacc ctatagtcgg acctgtccct     600

ggagtggccg tttttgccaa ctccctacat gtgagtgata aacctttccc gggagcaact     660

catgtgctaa ccaacctgcc actcccgcag aggcctaagc ctgaagactt ttgcccttttt    720

gagtgtgcta tggctgacgt ctatgatatt ggtcatggcg ccgtcatgta tgtggccaaa     780

gggaaagtct cctgggcccc tcgtggcggg gatgaggcga aatttgaaac tgtccctagg     840

gagttgaagt tgatcgcgaa ccaactccac atctccttcc cgccccacca cgcagtggac     900

atgtctaagt ttgtgttcat agcccctggg agtggtgtct ctatgcgggt cgagtgccca     960

cacggctgtc tccccgctaa tactgtccct gaaggtaact gctggtggcg cttgtttgac    1020

tcgctcccac tggacgttca gaacaaagaa attcgccgtg ccaaccaatt cggctatcaa    1080

accaagcatg gtgtcgctgg caagtaccta caacggaggc tgcaagctaa tggtctccga    1140

gcagtgactg atacagatgg acccattgtc gtacagtatt tctctgttag ggagagctgg    1200

atccgccact tcagactggc ggaagagcct agcctccctg ggtttgaaga cctcctcaga    1260

ataagggtag agcccaatac gtcgccattg agtgacaagg gtggaaaaat cttccggttt    1320

ggcagtcaca aatggtacgg tgctggaaag agagcaagga aagcacgctc tggtatgacc    1380

accacagtcg ctcaccgcgc cttgcccgct cgtgaaatcc agcaagccaa aaagcacgag    1440

gatgccggcg ctgataaggc tgtgcatctc aggcactatt ctccgcctgc cgacgggaac    1500

tgtggttggc actgcatttc cgccatcgcc aaccgaatgg tgaattccaa atttgaaact    1560

actcttcccg agagggtgag accttcagat gactgggcta ctgacgagga ccttgtgaac    1620

accatccaaa ttctcaagct ccctgcggcc ttggacagga acggtgcttg tgttggcgcc    1680

aaatacgtgc ttaagctgga aggcgagcat tggactgtct ctgtgaccct tgggatgtcc    1740
```

```
ccttctttgc tcccccttga atgtgttcag ggctgttgtg agcataagag cggacttggt   1800

cccccagatg cggtcgaagt tttcggattt gaccctgcct gccttgaccg actggctgag   1860

gtaatgcact tgcctagcag tgtcatccca gctgctctgg ccgaaatgtc cggcgacccc   1920

aactgtccgg cttccccggt cactactgtg tggactgttt cacaattctt tgcccgccac   1980

agaggaggag agcaccctga tcaggtgcgc ttaggaaaaa tcatcagcct ttgtcaagtt   2040

gttgaggaat gctgttgcca tcagaataaa accaaccggg ccaccccgga agaggttgcg   2100

gcaaggattg atcagtacct ccatggtgca acaagtcttg aagaatgctt gattaggctt   2160

gagagggttt gcccgccgag cgctgcggac accttctttg attggaatgt tgtgctccct   2220

ggggttgggg cttcaactca gacaaccaaa cagctccatg tcaaccagtg ccgcgctctg   2280

gttcctgtcg tgactcaaga gcctttggac aaagactcag tccctctgac cgccttctcg   2340

ctgtccaatt gctactatcc tgcacaaggt gacgaggttc gtcaccgtga gaggctaaac   2400

tccgtactct ctaagctgga ggggggttgtt cgtgaggaat atgggctcac gccaactgaa   2460

cctggcccgc gacccgcact accgaacggg ctcgtcgaac ttaaagacca gatggaggag   2520

gatctgctga aactagtcaa cgcccaggca acttcagaaa tgatggcctg ggcagccgag   2580

caggttgatc tgaaagcttg ggtcaaaaac tacccacggt ggacaccgcc acccccctcca   2640

ccaagagttc agcctcgaaa aacaaagtct gtcaagagct tgccagggaa caaacctgtc   2700

cccgctccac gcaggaaggt cagatctgat tgtggcagcc cgattttgat gggcgacaat   2760

gttcctgacg gtcgggaaga tttgactgtt ggtggcccc ttgatctttc gacaccatcc   2820

gagccgatga cacctctgag tgagcctgca cttatgcccg cgttgcaata tatttctagg   2880

ccagtgacat ctttgagtgt gctggcccca gttcctgcac cgcgtagaac tgtgtcccga   2940

ccggtgacgc ccttgagtga gccaattttt gtgtctgcac cgcgacacaa atttcagcag   3000

gtggaagaag cgaatctggc ggcaacaacg ctgacgcacc aggacgaacc tctagatttg   3060

tctgcatcct cacagactga atatgaggct ctcccctaa caccactgca gaacatgggt   3120

attctggagg tgggggggca agaagctgag gaagttctga gtgaaatctc ggatacactg   3180

aatgacatca accctgcacc tgtgtcatca agcagctccc tgtcaagtgt taagatcaca   3240

cgcccaaaac actctgctca agccatcatt gactcgggcg ggccctgcag tgggcatctc   3300

cgaagggaaa aagaagcatg cctcagcatc atgcgtgagg cttgtgatgc ggctaagctt   3360

agtgaccctg ccacgcagga atggctttct cgcatgtggg atagggttga catgctgact   3420

tggcgcaaca cgtctgctta ccaggcgttc cgcatcttag atggtaggtt tgagtttctc   3480

ccaaagatga tactcgagac accgccgccc tacccgtgtg ggtttgtgat gctgcctcac   3540

acgcctgcac cttccgtggg tgcagagagt gaccttacca ttggttcagt cgccactgaa   3600
```

Page 11

```
gatgttccac gcatcctcgg gaaaatagaa aacgccggcg agatgcccaa ccagggggctc      3660

ttgacatcct tcggggaaga accggtgtgc gaccaacctg tcaaggactc ctggatgtcg      3720

tcgcgggggt ttgacgagag cacaacggct ccgtccgctg gtacaggtgg tgctgactta      3780

cccaccgatt tgccaccttc agatggtttg gatgcggacg agtggggggcc gttacggacg      3840

gtaagaaaga aagctgaaag gctcttcgac caattgagcc gtcaggtttt taacctcgtc      3900

tcccatctcc ctgttttctt ctcacacctc ttcaaatctg acagtggtta ttctccgggt      3960

gattggggtt ttgcagcttt tactttattt tgcctctttt tgtgttacag ctacccattc      4020

tttggttttg ttcccctctt gggtgttttt tctgggtctt ctcggcgtgt gcgcatgggg      4080

gtttttggct gttggttggc ttttgctgtt ggcctgttca agcctgtgtc cgacccagtc      4140

ggcactgctt gtgagtttga ctcgccagag tgtaggaacg tccttcattc ttttgagctt      4200

ctcaaacctt gggaccctgt tcgcagcctt gttgtgggcc ccgtcggtct cggccttgcc      4260

attcttggca ggttactggg cggggcacgc tacatctggc attttttgct taggcttggc      ·4320

attgttgcag attgtatctt ggctggagct tatgtgcttt ctcaaggtag gtgtaaaaag      4380

tgctggggat cttgtgtaag aactgctcct aatgaaatcg ccttcaacgt gttccctttt      4440

acgcgtgcga ccaggtcgtc actcatcgac ctgtgcgatc ggttttgtgc gccaaaaggc      4500

atggacccca ttttcctcgc tactgggtgg cgcgggtgct ggaccggccg aagtcccatt      4560

gagcaaccct ctgaaaaacc catcgcgttc gcccagttgg atgaaaagag gattacggct      4620

agaactgtgg gcgctcagcc ttatgatcct aaccaagccg taaagtgctt gcgggtgtta      4680

caggcgggtg gggcgatagt ggccgaggca gtcccaaaag tggtcaaggt ttccgctatt      4740

ccattccgag ctcccttttt tcccaccgga gtgaaggttg atcctgagtg caggatcgtg      4800

gtcgaccccg acacttttac tacagctctc cggtctggtt actccaccac aaacctcgtc      4860

cttggtgtgg gggactttgc ccaactgaat ggattaaaaa tcaggcaaat ttccaagccc      4920

tcgggaggag gcccgcacct cattgctgcc ctgcatgttg cttgctcgat ggcgttgcac      4980

atgcttgctg gagtttatgt aactgcagtg gggtcttgcg gtaccggcac caacgatccg      5040

tggtgcacta acccattcgc cgtccctggc tacggacctg gctccctctg cacgtccaga      5100

ttgtgcatct cccaacatgg ccttaccctg cccttgacag cacttgtggc aggattcggt      5160

cttcaggaaa ttgccctagt cgttttgatt ttcgtttcca tcggaggcat ggctcatagg      5220

ttgagttgta aggctgatat gctgtgcgtc ttacttgcaa tcgccagcta tgtttgggta      5280

ccccttacct ggttgctctg tgtgtttcct tgctggttgc ctggttctc tttgcaccct      5340

ctcaccattc tatggttggt gttttttcttg atgtctgtaa atatgccttc gggaatctta      5400

accgtggtgt tattggttgc tctttggctt ctaggccgtt atactaatgt tgttggtctt      5460

gttaccccct atgatattca tcattacacc aatggccccc gcggtgttgc cgccttggct      5520
```

```
accgcaccag atgggactta cttggccgct gtccgccgcg ctgcgttgac tggccgcacc    5580

gtgctgttta ccccgtctca gcttgggtcc cttcttgagg gcgctttcag aactcgaaag    5640

ccctcactga acaccgtcaa tgtggtcggg tcctccatgg gctctggcgg agtgttcact    5700

atcgatggga aaattaagtg cgtgactgcc gcacatgtcc ttacgggtaa ttcagccagg    5760

gtttccgggg tcggcttcaa tcaaatgctt gactttgatg taaaagggga cttcgccata    5820

gctgattgcc cgaattggca aggggctgct cctaagaccc aattctgcga ggatggatgg    5880

actggccgcg cctattggct gacatcctct ggcgtcgaac ccggtgtcat tgggaatgga    5940

ttcgccttct gcttcaccgc gtgcggcgat tccgggtccc cagtgatcac cgaagccggt    6000

gagcttgtcg gcgttcacac aggatcaaac aaacaaggag gaggcattgt tacgcgcccc    6060

tctggccagt tttgcaatgt ggcacccatc aagctgagcg aattaagtga gttctttgct    6120

ggacctaagg tcccgctcgg tgatgtgaag gttggcagcc acataattaa agacatatgc    6180

gaggtacctt cagatctttg cgccttgctt gctgccaaac ccgaactgga aggaggcctc    6240

tccaccgtcc aacttctgtg tgtgtttttc ctcctgtgga gaatgatggg acatgcctgg    6300

acgcccttgg ttgctgttgg gttttttatc ttgaatgagg ttctcccagc tgtactggtc    6360

cggagtgttt tctcctttgg aatgtttgtg ctatcttggc tcacaccatg gtctgcgcaa    6420

gttctgatga tcaggcttct aacagcagct cttaacagga acagattgtc actcgccttt    6480

tacagccttg gtgcagcgac cggttttgtc gcagatctgg cggcaactca agggcacccg    6540

ttgcaggcag taatgaattt aagtacctat gccttcctgc ctcggataat ggtcgtgacc    6600

tcaccagtcc cagtgattgc gtgtggtgtt gtgcacctcc ttgccataat tttgtacttg    6660

tttaagtacc gctgcctgca caatgtcctt gttggcgatg gtgcgttctc tgcggctttc    6720

ttcttgcgat actttgccga ggggaaattg agggaagggg tgtcgcaatc ctgcgggatg    6780

aatcatgagt cgctgactgg tgccctcgct atgagactta atgacgagga cttggatttt    6840

cttacgaaat ggactgattt taagtgtttt gtttctgcat ccaacatgag gaatgcggcg    6900

ggccagttca tcgaggctgc ctatgctaaa gcacttagaa ttgaacttgc ccagttggtg    6960

caggttgata aggttcgagg tactttggcc aaacttgaag cttttgctga taccgtggca    7020

ccccaactct cgcccggtga cattgttgtt gctcttggcc atacgcctgt tggcggtatc    7080

ttcgacctaa aggttggtag caccaagcat accctccaag ccattgagac cagagttctt    7140

gccgggtcca aaatgaccgt ggcgcgtgtc gttgatccaa cccccacacc cccacccgca    7200

cccgtgccta tccccttcc accgaaagtt ctggagaatg gtcccaacgc ctggggggat    7260

gaggatcgtt tgaataagaa gaagaggcgc aggatggaag ccgtcggcat ctttgttatg    7320

ggtggaaaga aatatcagaa attttgggac aagaactccg gtgatgtgtt ttatgaggag    7380
```

Page 13

```
gtccatgata acacagacgc gtgggagtgc ctcagagttg acaaccctgc cgactttgac    7440

cctgagaagg gaactctgtg cgggcatact accattgaag ataagactta cagtgtctac    7500

gcctccccat ctggcaagaa attcctggtc cccgtctacc cagagagcaa aaaaaaccaa    7560

tgggaagctg cgaagctttc cgtggaacag gcccttggca tgatgaatgt cgacggtgaa    7620

ctgacagcca aagaagtgga gaaactgaaa agaataattg acaaactcca gggcctgact    7680

aaggagcagt gtttaaactg ctagccgcca gcggcttgac ccgctgtggt cgcggcggct    7740

tggttgttac tgagacagcg gtaaaaatag tcaaatttca caaccggacc ttcaccctag    7800

gacctgtgaa tttaaaagtg gccagtgagg ttgagctaaa agacgcggtc gagcataacc    7860

aacacccggt tgcaagaccg gttgatggtg gtgttgtgct cctgcgctcc gcagttcctt    7920

cgcttataga cgtcttaatc tccggcgctg atgcatctcc caagttactc gcccgccacg    7980

ggccgggaaa cactgggatc gatggcacgc tttgggattt tgaggccgag gccactaaag    8040

aggaaattgc actcagtgcg caaataatac aggcttgtga cattaggcgc ggcgacgcac    8100

ctgaaattgg tcttccttat aagctgtacc ctgtcagggg caaccctgag cgggtaaaag    8160

gagttttaca gaatacaagg tttggagaca taccttataa aaccccagt gacactggaa     8220

gcccagtgca cgcggctgcc tgcctcacgc ccaatgccac tccggtgact gatgggcgct    8280

ccgtcttggc cacgactatg ccctccggtt ttgagttgta tgtaccgacc attccagcgt    8340

ctgtccttga ttatcttgat tctaggcctg actgccccaa acagttgaca gagcacggct    8400

gtgaggacgc cgcattaaga gacctctcca agtatgactt gtccacccaa ggctttgttt    8460

tacctggagt tcttcgcctt gtgcgtaagt acctgtttgc tcatgtgggt aagtgcccgc    8520

ccgttcatcg gccttccact taccctgcca agaattctat ggctggaata aatgggaaca    8580

ggtttccaac caaggacatc cagagcgtcc ctgaaatcga cgttctgtgc gcacaggccg    8640

tgcgggaaaa ctggcaaact gttacccctt gtaccctcaa gaaacagtat tgtgggaaga    8700

agaagactag gacaatactc ggcaccaata acttcattgc gctggcccac cgggcagcgt    8760

tgagtggtgt cacccagggc ttcatgaaaa aggcgtttaa ctcgcccatt gccctcggta    8820

aaaacaaatt taaagagctt cagactccgg tcttaggcag gtgccttgaa gctgatcttg    8880

catcctgcga tcgctccaca cctgcaattg tccgctggtt tgccgccaat cttctttatg    8940

aacttgcctg tgctgaagag cacctgccgt cgtacgtgtt gaactgctgc cacgacctac    9000

tggtcacgca gtccggcgca gtaactaaga gaggtggcct gtcgtctggc gacccgatca    9060

cttctgtgtc caacaccatt tacagcttgg tgatatatgc acaacacatg gtgctcagtt    9120

actttaaaag tggtcaccct catggccttc tgtttctaca agaccagctg aagtttgagg    9180

acatgctcaa ggttcaaccc ctgatcgtct attcggacga cctcgtactg tatgccgagt    9240

ctcccaccat gccaaactac cactggtggg ttgaacatct gaacctgatg ctgggttttc    9300
```
                                    Page 14

```
agacggaccc aaagaagaca gccataacag actcgccatc atttctaggc tgtaggataa    9360

taaatggacg ccagctcgtc cctaaccgtg acaggattct cgcggccctc gcctaccata    9420

tgaaggcaag caatgtctct gaatactacg cctcggcggc tgcgatactc atggacagct    9480

gtgcttgttt agagtatgat cccgaatggt ttgaagagct tgtagttggg atagcgcagt    9540

gtgcccgcaa ggacggctac agttttcccg gcccgccgtt cttcttgtcc atgtgggaaa    9600

aactcagatc caatcatgag gggaagaagt ccagaatgtg cgggtactgc ggggccccgg    9660

ctccgtacgc cactgcctgt ggcctcgacg tctgtattta ccacacccac ttccaccagc    9720

attgtccagt catcatctgg tgtggccacc cggctggttc tggttcttgt agtgagtgca    9780

aacccccect agggaaaggc acaagccctc tagatgaggt gttagaacaa gtcccgtata    9840

agcctccacg gactgtaatc atgcatgtgg agcagggtct caccctctt gacccaggca     9900

gataccagac tcgccgcgga ttagtctccg ttaggcgtgg cattagagga aatgaggttg    9960

atctaccaga cggtgattat gctagcaccg ccctactccc tacttgtaaa gagattaaca   10020

tggtcgctgt cgcctctaat gtgttgcgca gcaggttcat catcggcccg cctggtgctg   10080

ggaaaacata ctggctcctt caacaggtcc aggatggtga tgtcatttac acgccaactc   10140

accagaccat gctcgatatg attagggctt tggggacgtg ccggttcaac gtcccagcag   10200

gtacgacgct gcaattccct gcccctccc gtaccggccc ttgggttcgc atcctagccg    10260

gcggttggtg tcctggcaag aattccttcc tggatgaagc agcgtattgt aatcaccttg   10320

atgtcttgag gcttcttagc aaaactaccc tcacctgtct gggagatttc aaacaactcc   10380

acccagtggg ttttgattct cattgctatg tttttgacat catgcctcag actcaactga   10440

agaccatctg gagatttgga cagaatatct gtgatgccat tcagccagat tacagggaca   10500

aacttgtatc catggtcaac acaacccgtg taacctacgt ggaaaaacct gtcaagtatg   10560

ggcaagtcct caccccttac cacagggacc gagaggacgg cgccatcaca attgactcca   10620

gtcaaggcgc cacatttgat gtggttacac tgcatttgcc cactaaagat tcactcaaca   10680

ggcaaagagc ccttgttgct attaccaggg caagacatgc tatctttgtg tatgacccac   10740

acaggcaact gcagagcatg tttgatcttc ctgcgaaagg cacacccgtc aacctcgctg   10800

tgcaccgtga cgagcagctg atcgtgctag atagaaataa caaagaatgc acggttgctc   10860

aggctctagg caatggggat aaattcaggg ccacagacaa gcgcgttgta gattctctcc   10920

gcgccatttg tgcagatctg gaagggtcga ctccccgct ccccaaggtc gcacacaact    10980

tgggatttta tttctcgcct gatttgacac agtttgctaa actcccggta gaacttgcac   11040

cccactggcc cgtggtgaca acccagaaca atgaaaagtg gccagaccgg ttggttgcta   11100

gccttcgccc cgtccataag tatagccgcg cgtgcatcgg tgccggctac atggtggggcc   11160
```

Page 15

```
cctcagtgtt tctgggcacc cctggggttg tgtcatacta tctcacaaaa tttgtcaggg   11220

gcgaggctca aatgcttccg gagacagtct tcagcaccgg ccgaattgag gtagattgcc   11280

gtgagtatct tgatgaccgg gagcgagaaa ttgctgagtc cctcccccat gctttcattg   11340

gcgacgtcaa aggcactacc gttggaggat gtcaccatgt cacctccaaa taccttccgc   11400

gcttccttcc caaggaatca gtcgcggtag tcggggtttc aagccccggg aaagccgcaa   11460

aagcagtttg cacattaaca gatgtgtatc tcccagatct cgaagcttac ctccacccag   11520

agacccagtc caagtgctgg aaaatgatgt tggacttcaa ggaagttcga ctgatggtct   11580

ggaaggacaa gacggcctat tttcaacttg aaggccgcca tttcacctgg taccagcttg   11640

caagctatgc ctcgtacatc cgagttcctg ttaactctac ggtgtatttg gacccctgca   11700

tgggccctgc cctttgcaac agaagagttg tcgggtccac tcattgggga gctgacctcg   11760

cagtcacccc ttatgattac ggtgccaaaa tcatcctgtc tagtgcatac catggtgaaa   11820

tgccccctgg gtacaaaatc ctggcgtgcg cggagttctc gcttgacgat ccagtgaggt   11880

acaaacacac ctgggggttt gaatcggata cagcgtatct gtacgagttc accggaaacg   11940

gtgaggactg ggaggattac aatgatgcgt ttcgtgcgcg ccagaaaggg aaaatttata   12000

aggccactgc caccagcatg aggtttcatt ttccccgggg ccctgtcatt gaaccaactt   12060

taggcctgaa ttgaaatgaa atggggtcca tgcaaagcct ctttgacaaa attggccaac   12120

tttttgtgga tgctttcacg gaatttttgg tgtccattgt tgatatcatc atattttggg   12180

ccattttgtt tggctttacc atcgctggct ggctggtggt cttctgcatc cgattggttt   12240

gctccgcggt actccgtgcg cgccctacca ttcaccctga gcaattacag aagatcctat   12300

gaggcctttc tttctcagtg ccaggtggat attcccacct ggggaactag acatcccctg   12360

gggatgtttt ggcaccataa ggtgtcaacc ctgattgatg aaatggtgtc gcgtcggatg   12420

taccgcacca tggaaaaagc aggacaggct gcctggaaac aggtggtgag cgaggccacg   12480

ctgtctcgca ttagtggttt ggatgtggtg gctcattttc agcatcttgc cgccattgaa   12540

gccgagacct gtaaatattt ggcctctcgg ctgcccatgc tacacaatct gcgcatgaca   12600

gggtcaaatg taaccatagt gtataatagt actttgaatc aggtgtttgc tattttttcca   12660

acccctggat cccggccaaa gcttcatgat tttcagcaat ggctaatagc tgtgcactcc   12720

tccatatttt cctccgttgc ggcttcttgt actcttttg ttgtgctgtg gttgcggatt   12780

ccaatactac gtactgtttt tggtttccgc tggttagggg caatttttcc ttcgaactca   12840

cggtgaatta cacggtgtgt ccgccttgcc tcacccggca agcagccgct gaggtctacg   12900

aaccaggcag gtctctttgg tgcaggatag ggcatgaccg atgtagtgag gacgaccatg   12960

acgatctagg gttcatggtt ccgcctggcc tctccagcga aggccacttg accagtgttt   13020

acgcctggtt ggcgttcctg tccttcagct acacggccca gttccatccc gagatatttg   13080
```
Page 16

```
ggataggggaa  tgtgagtcaa  gtttatgttg  acatcaagca  ccaattcatc  tgcgccgttc  13140
acgacgggga  gaacgccacc  ttgcctcgtc  atgacaatat  ttcagccgta  tttcagacct  13200
actaccaaca  tcaagtcgac  ggcggcaatt  ggtttcacct  agaatggctg  cgccccttct  13260
tttcctcttg  gttggtttta  aatgtttctt  ggtttctcag  gcgttcgcct  gcaagccatg  13320
tttcagttca  agtctttcgg  acatcaaaac  caacactacc  gcagcatcag  gctttgttgt  13380
cctccaggac  atcagctgcc  ttaggcatgg  cgactcgtcc  tctcagacga  ttcgcaaaag  13440
ctctcagtgc  cgcgcggcga  tagggacgcc  cgtgtacatc  actgtcacag  ccaatgtcac  13500
agatgagaat  tatttacatt  cttctgatct  ccttatgctt  tcttcttgcc  ttttctatgc  13560
ttctgagatg  agtgaaaagg  gattcaaggt  gatatttggc  aatgtgtcag  gcatcgtggc  13620
tgtgtgtgtc  aactttacca  gctacgtcca  acatgtcaag  gagtttaccc  aacgctcctt  13680
ggtggtcgat  catgtgcggc  tgctccattt  catgacacct  gagaccatga  ggtgggcaac  13740
cgttttagcc  tgtttttttg  ccatcttact  ggcaatttga  atgttcaagt  atgttgggga  13800
gatgcttgac  cgcgggctgt  tgctcgcgat  tgctttcttt  gtggtgtatc  gtgccatttt  13860
gttttgctgc  gctcgtcaac  gccaacagca  acagcagctc  tcatcttcag  ttgatttaca  13920
acttgacgct  atgtgagctg  aatggcacag  attggctgaa  agacaaattt  gattgggcag  13980
tggagacttt  tgtcatcttt  cccgtgttga  ctcacattgt  ctcatatggt  gcactcacca  14040
ctagccattt  ccttgacaca  gtcggtctgg  ttactgtgtc  taccgccggg  ttctaccacg  14100
ggcggtatgt  tctgagtagc  atctacgcgg  tctgcgctct  ggccgcattg  atttgcttcg  14160
tcattaggct  tgcgaagaac  tgcatgtcct  ggcgctactc  ttgtaccaga  tatactaact  14220
tccttctgga  cactaagggc  agactctatc  gctggcggtc  gcccgttatc  atagagaaag  14280
ggggtaaggt  tgaggtcgaa  ggtcacctga  tcgacctcaa  aagagttgtg  cttgatggtt  14340
ccgtggcaac  ccctttaacc  agagtttcag  cggaacaatg  gggtcgtctt  tagacgactt  14400
ttgctatgat  agcacggctc  cacaaaaggt  gcttttggcg  ttttccatta  cctacacgcc  14460
agtgatgata  tatgctctaa  aggtaagtcg  cggccgactt  ttagggcttc  tgcacctttt  14520
gatctttctg  aattgtactt  ttaccttcgg  gtacatgaca  ttcgtgcact  ttaatagcac  14580
aaataaggtc  gcgctcacta  tgggagcagt  agttgcactt  ctttggggggg  tgtactcagc  14640
catagaaacc  tggaagttca  tcacctccag  atgccgtttg  tgcttgctag  gccgcaagta  14700
cattctggcc  cccgcccacc  acgtcgaaag  tgccgcgggc  tttcatccga  tcgcggcaaa  14760
tgataaccac  gcatttgtcg  tccggcgtcc  cggctccact  acggttaacg  gcacattggt  14820
gcccgggttg  aaaagcctcg  tgttgggtgg  cagaaaagct  gttaaacagg  gagtggtaaa  14880
ccttgtcaaa  tatgccaaat  aacaacggca  agcagcaaaa  gaaaagagg  gggaatggcc  14940
```

Page 17

```
agccagtcaa tcagctgtgc cagatgctgg gtaagatcat cgcccagcaa aaccagtcca  15000

gaggcaaggg accggggaag aaaattaaga ataaaaaccc ggagaagccc cattttcctc  15060

tagcgactga agatgacgtc aggcatcact tcacccctag tgagcggcaa ttgtgtctgt  15120

cgtcgatcca gactgccttt aaccagggcg ctggaacctg taccctatca gattcaggta  15180

ggataagtta cactgtggag tttagtttgc cgacgcatca tactgtgcgc ctgatccgcg  15240

tcacagcgcc atcatcagcg taatgggctg gcattcctta agcacctcag tgttagaatt  15300

ggaagaatgt gtggtgaatg cactgattg gcactgtgcc tctaagtcac ctattcaatt  15360

agggcgaccg tgtgggggtt aagtttaatt ggcgagaacc atgcggccga aattaaaaaa  15420

aaaa                                                                15424
```

<210> 3

<211> 15413

<212> RNA

<213> Porcine reproductive and respiratory syndrome virus

<400> 3
```
augacguaua ggguguuggcu cuaugccuug gcauuuguau ugucaggagc ugcgaccauu   60

ggcacagccc aaaacuagcu gcacagaaaa cgcccuucug ugacagcccu cuucagggga  120

gcuuaggggu cuguccccuag caccuugcuu ccggaguugc acugcuuuac ggucucucca  180

acccuuuaac caugucuggg auacuugauc ggugcacgug caccccccaau gccaggguguu  240

uuauggcgga gggccaaguc uacugcacac gaugucucag ugcacggucu cuccuuccuc  300

ugaaucucca aguuccugag cuuggagugc ugggccuauu uuacaggccc gaagagccac  360

uccgguggac guugccacgu gcauucccca cuguugagug cuccccccgcc ggggccugcu  420

ggcuuucugc gaucuuucca auugcacgaa ugaccagugg aaaccugaac uuucaacaaa  480

gaauggugcg ggucgcagcu gagauuuaca gagccggcca gcucacccccu gcagucuuga  540

aggcucuaca aguuuaugaa cgggguugcc gcugguaccc uauagucgga ccugucccug  600

gaguggccga uuuugccaac ucccuacaug ugagugauaa accuuuuccccg ggagcaacuc  660

augugcuaac caaccugcca cucccagaga ggccuaagcc ugaagacuuu ugcccuucug  720

agugugcuau ggcugacguc uaugauauug gccauggcgc cgucauguau guggccaaag  780

ggaaagucuc cugggcccccu cguggcgggg augaggcgaa auuugaaccu gucccuaggg  840

aguugaaguu gaucgcgaac caacuccaca ucuccuuccc gccccaccac gcaguggaca  900

ugucuaaguu uguguucaua gccccuggga ggguguucuc uaugcggguc gagugcccac  960

acggcugucu ccccgcuaau acuguuccccug aagguaacug cugguggcgc uuguuugacu  1020
```
                              Page 18

```
cgcucccacu ggacguucag aacaaagaaa uucgccgugc caaccaauuc ggcuaucaaa    1080

ccaagcaugg ugucgcuggc aaguaccuac aacggaggcu gcaagcuaau ggucuccgag    1140

cagugacuga uacagaugga cccauugucg uacaguauuu cucuguuagg gagagcugga    1200

uccgccacuu cagacuggcg gaagagccua gccucccugg guuugaagac cuccucagaa    1260

uaaggguaga gcccaauacg ucgccauuga gugacaaggg uggaaaaauc uuccgguuug    1320

gcagucacaa augguacggu gcuggaaaga gagcaaggaa agcacgcucu gguaugacca    1380

ccacagucgc ucaccgcgcc uugcccgcuc gugaaaucca gcaagccaaa aagcacgagg    1440

augccggcgc ugauaaggcu gugcaucuca ggcacuauuc uccgccugcc gacgggaacu    1500

gugguuggca cugcauuucc gccaucgcca accgaauggu gaauuccaaa uuugaaacua    1560

cucuucccga gagggugaga ccuucagaug acugggcuac ugacgaggac cuugugaaca    1620

ccauccaaau ucucaagcuc ccugcggccu uggacaggaa cggugcuugu guuggcgcca    1680

aauacgugcu uaagcuggaa ggcgagcauu ggacugucuc ugugacccuu gggauguccc    1740

cuucuuugcu ccccccuugaa uguguucagg gcuguuguga gcauaagagc ggacuugguc    1800

ccccagaugc ggucgaaguu uucggauuug acccugccug ccuugaccga cuggcugagg    1860

uaaugcacuu gccuagcagu gucaucccag cugcucuggc cgaaaugucc ggcgaccca    1920

accguccggc uuccccgguc acuacugugu ggacuguuuc acaauucuuu gcccgccaca    1980

gaggaggaga gcacccugau caggugcgcu uaggaaaaau caucagccuu ugucaaguug    2040

uugaggaaug cuguugccau cagaauaaaa ccaaccgggc caccccggaa gagguugcgg    2100

caaggauuga ucaguaccuc cauggugcaa caagucuuga agaaugcuug auuaggcuug    2160

agaggguuug cccgccgagc gcugcggaca ccuucuuuga uuggaauguu gugcucccug    2220

ggguuggggc uucaacucag acaaccaaac agcuccaugu caaccagugc cgcgcucugg    2280

uuccugucgu gacucaagag ccuuuggaca aagacccagu cccucugacc gccuucucgc    2340

uguccaauug cuacuauccu gcacaaggug acgagguucg ucaccgugag aggcuaaacu    2400

ccguacucuc uaagcuggag gggguuguuc gugaggaaua ugggcucacg ccaacuggac    2460

cuggcccgcg acccgcacua ccgaacgggc ucgucgaacu uaaagaccag auggaggagg    2520

aucugcuaaa acuagcaac gcccaggcaa cuucagaaau gauggccugg gcagccgagc    2580

agguugaucu gaaagcuugg gucaaaaacu acccacggug gacaccguca ccccccuccac    2640

caagaguuca gccucgaaaa acaaagccug ucaagagcuu gccagggaac aaaccugucc    2700

ccgcuccacg caggaagguc agaucugauu guggcagccc gauuucgaug ggcgacaaug    2760

uuccugacgg ucgggaagau uugacuguug guggcccccu ugaucuuucg acaccauccg    2820

agccgaugac accucugagu gagccugcac cuaugcccgc guugcaauau auuucuaggc    2880
```

Page 19

```
cagugacacc uuugagugug cuggccccag uaccugcacc gcguagaacu gugucccgac    2940

cggugacgcc cuugagugag ccaauuuuug ugucugcacc gcgacacaaa uuucagcagg    3000

uggaagaagc gaaucuggcg gcaacaaugc ugacgcacca ggacgaaccu cuagauuugu    3060

cugcauccuc acagacugaa uaugaggcuu cucccuaac accacugcag aacaugggua     3120

uucuggaggu ggggggggcaa gaagcugagg aaguucugag ugaaaacucg gauacacuga   3180

augacaucaa cccugcaccu gugucaucaa gcagcucccu gucaaguguu aagaucacac    3240

gcccaaaaca cucugcucaa gccaucauug acucgggcgg gcccugcagu gggcaucucc    3300

gaaagggaaa agaagcaugc cucagcauca ugcgugaggc uugugaugcg gcuaagcuua    3360

gugacccugc cacgcaggaa uggcuuucuc gcauguggga uaggguugau augcugacuu    3420

ggcgcaacac gucugcuuac caggcguucc gcaucuuaga ugguagguuu gaguuucucc    3480

caaagaugau acucgagaca ccgccgcccu acccgugugg guuugugaug cugccucgca    3540

cgccugcacc uuccgugggu gcagagagug accuuaccau ugguucaguc gccacugaag    3600

auguuccacg cauccucggg aaaauagaaa acgccggcaa gaugcccaac caggggcucu    3660

ugacauccuu cggggaagaa ccggugugcg accaaccugu caaggacucc uggaugucgu    3720

cgcggggguu ugacgagagc acaacggcuc cguccgcugg uacagguggu gcugacuuac    3780

ccaccgauuu gccaccuuca gaugguuugg augcggacga gugggggccg uuacggacgg    3840

uaagaaagaa agcugaaagg cucuucgacc aauugagccg ucagguuuuu aaccucgucu    3900

cccaucuccc uguuuucuuc ucacaccucu ucaaaucuga cagugguuau ucuccggcug    3960

auugggguuu ugcagcuuuu acuuuauuuu gccucuuuuu guguuacagc uacccauucu    4020

uugguuuugu uccccucuug ggguguuuuu cugggcuuc ucggcgugug cgcauggggg     4080

uuuuuggcug uugguuggcu uuugcuguug gccuguucaa gccugugucc gacccagucg    4140

gcacugcuug ugaguuugac ucgccagagu guaggaacgu ccuucauucu uuugagcuuc    4200

ucaaaccuug ggacccuguu cgcagccuug uugugggccc cgucggcuc ggccuugcca     4260

uucuuggcag guuacugggc ggggcacgcu acaucuggca uuuuuugcuu aggcuuggca    4320

uuguugcaga uuguaucuug gcuggagcuu augugcuuuc ucaagguagg uguaaaaagu    4380

gcuggggauc uuguguaaga acugcuccua augaaaucgc cuucaacgug uucccuuuua    4440

cgcgugcgac caggucguca cucaucgacc ugugcgaucg guuuugugcg ccaaaaggca    4500

uggaccccau uuuccucgcu acuggguggc gcgggugcug gaacggccga agucccauug    4560

agcaacccuc ugaaaacccc aucgcguucg cccaguugga ugaaagagg aucacggcua     4620

gaacuguggu cgcucagccu uaugauccua accaagccgu aaagugcuug cggguguuac    4680

aggcgggugg ggcgauagug gccgaggcag ucccaaaagu ggucaagguu uccgcuauuc    4740

cauuccgagc ucccuuuuuu cccaccggag ugaagguuga uccugagugc aggaucgugg    4800
```
Page 20

```
ucgaccccga cacuuuuacu acagcucucc ggucugguua cuccaccaca aaccucgucc   4860

uuggguuagg ggacuuugcc caacugaaug gauuaaaaau caggcaaauu uccaagcccu   4920

cgggaggagg cccgcaccuc auugcugccc ugcauguugc uugcucgaug gcguugcaca   4980

ugcuugcugg aguuuaugua acugcagugg ggucuugcgg uaccggcacc aacgauccgu   5040

ggugcacuaa cccauucgcc gucccuggcu acggaccugg cucccucugc acguccagau   5100

ugugcaucuc ccaacauggc cuuacccugc ccuugacagc acuguggca ggauucgguc   5160

uucaggaaau ugcccuaguc guuugauuu ucguuuccau cggaggcaug gcucauaggu   5220

ugaguuguaa ggcugauaug cugugcgucu uacuugcaau cgccagcuau guuuggguac   5280

cccuuaccug guugcucugu guguuuccuu gcugguugcg cugguucucu uugcacccuc   5340

ucaccauucu augguuggug uuuuucuuga ugucuguaaa uaugccuucg ggaaucuuaa   5400

ccguggguguu auugguugcu cuuuggcuuc uaggccguua uacuaauguu guugguccug   5460

uuacccccua ugauauucac cauuacacca auggcccccg cggcguugcc gccuuggcua   5520

ccgcaccaga ugggacuuac uuggccgcug uccgccgcgc ugcguugacu ggccgcaccg   5580

ugcuguuuac cccgucucag cuuggguccc uucuugaggg cgcuuucaga acucgaaagc   5640

ccucacugaa caccgucaau guggucgggu ccuccauggg cucuggcgga guguucacua   5700

ucgaugggaa aauuaagugc gugacugccg cacauguccu uacggguaau ucagccaggg   5760

uuuccggggu cggcuuuaau caaaugcuug acuuugaugu aaaaggggac uucgccauag   5820

cugacugccc gaauuggcaa ggggcugcuc cuaagaccca auucugcgag gauggaugga   5880

cuggccgcgc cuauuggcug acauccucug gcgucgaacc cggugucauu gggaauggau   5940

ucgccuucug cuucaccgcg ugcggcgauu ccggguccc agugaucacc gaagccggug   6000

agcuugucgg cguucacaca ggaucaaaca aacaaggagg aggcauuguu acgcgccccu   6060

cuggccaguu uugcaaugug gcacccauca agcugagcga auuaagugag uucuuugcug   6120

gaccuaaggu cccgcucggu gaugugaagg uuggcagcca cauaauuaaa gacauaugcg   6180

agguaccuuc agaucuuugc gccuugcuug cugccaaacc cgaacuggaa ggaggccucu   6240

ccaccgucca acuucugugu guguuuuucc uccuguggag aaugauggga caugccugga   6300

cgcccuuggu ugcuguuggg uuuuuuaucu ugaaugaggu ucucccagcu guacuggucc   6360

ggaguguuuu cuccuuugga auguuugugc uaucuuggcu cacaccaugg ucugcgcaag   6420

uucugaugau caggcuucua acagcagcuc uuaacaggaa cagauuguca cucgccuuuu   6480

acagccuugg ugcagcgacc gguuuugucg cagaucuggc ggcaacucaa gggcacccgu   6540

ugcaggcagu aaugaauuua aguaccuaug ccuuccugcc ucggauaaug gucgugaccu   6600

caccaguccc agugauugcg ugugguguug ugcaccuccu ugccauaauu uuguacuugu   6660
```

Page 21

```
uuaaguaccg cugccugcac aauguccuug uuggcgaugg ugcguucucu gcggcuuucu   6720

ucuugcgaua cuuugccgag gggaaauuga gggaaggggu gucgcaaucc ugcgggauga   6780

aucaugaguc gcugacuggu gcccucgcua ugagacuuaa ugacgaggac uuggauuuuc   6840

uuacgaaaug gacugauuuu aaguguuuug uuucugcauc caacaugagg aaugcggcgg   6900

gccaguucau cgaggcugcc uaugcuaaag cacuuagaau ugaacuugcc caguuggugc   6960

agguugauaa gguucgaggu acuuuggcca aacuugaagc uuuugcugau accguggcac   7020

cccaacucuc gcccggugac auuguuguug cucuuggcca uacgccuguu ggcgguaucu   7080

ucgaccuaaa gguugguagc accaagcaua cccuccaagc cauugagacc agaguucuug   7140

ccggguccaa aaugaccgug gcgcgugucg uugauccaac ccccacaccc ccacccgcac   7200

ccgugccuau ccccuucca ccgaaaguuc uggagaaugg ucccaacgcc uggggggaug   7260

aggaucguuu gaauaagaag aagaggcgca agauggaagc cgucggcauc uuuguuaugg   7320

guggaaagaa auaucagaaa uuuugggaca agaacuccgg ugauguguuu uaugaggagg   ·7380

uccaugauaa cacagacgcg ugggagugcc ucagaguuga caacccugcc gacuuugacc   7440

cugagaaggg aacucugugc gggcauacua ccauugaaga uaagacuuac agugucuacg   7500

ccuccccauc uggcaagaaa uuccuggucc ccgccuaccc agagagcaaa aaaaaccaau   7560

gggaagcugc gaagcuuucc guggaacagg cccuuggcau gaugaauguc gacggugaac   7620

ugacagccaa agaaguggag aaacugaaaa gaauaauuga caaacuccag ggccugacua   7680

aggagcagug uuuaaacugc uagccgccag cggcuugacc cgcugugguc gcggcggcuu   7740

gguuauuacu gagacagcgg uaaaaauagu caaauuucac aaccggaccu ucacccuagg   7800

accugugaau uuaaaagugg ccagugaggu ugagcuaaaa gacgcggucg agcauaacca   7860

acacccgguu gcaagaccgg uugauggugg uguugugcuc cugcgcuccg caguuccuuc   7920

gcuuauagac gucuaaaucu ccggcgcuga ugcaucuccc aaguuacucg cccgccacgg   7980

gccgggaaac acugggaucg auggcacgcu uugggauuuu gaggccgagg ccacuaaaga   8040

ggaaauugca cucagugcgc aaauaauaca ggcuugugac auuaggcgcg gcgacgcacc   8100

ugaaauuggu cuuccuuaua agcuguaccc ugucaggggc aacccugagc ggguaaaagg   8160

aguuuuacag aauacaaggu uuggagauau accuuauaaa accccccagug acacuggaag   8220

cccagugcac gcggcugccu gccucacgcc caaugccacu ccggugacug augggcgcuc   8280

cgucuuggcc acgacuaugc ccuccgguuu ugaguuguau guaccgacca uuccagcguc   8340

uguccuugau uaucuugauu cuaggccuga cugccccaaa caguugacag agcacggcug   8400

ugaggacgcc gcauuaagag accucuccaa guaugacuug uccacccaag gcuuuguuuu   8460

accuggaguu cuucgccuug ugcguaagua ccuguuugcu caugugggua agugccgccc   8520

cguucaucgg ccuuccacuu acccugccaa gaauucuaug gcuggaauaa augggaacag   8580
```

```
guuuccaacc  aaggacaucc  agagcguccc  ugaaaucgac  guucugugcg  cacaggccgu   8640

ucgggaaaac  uggcaaacug  uuaccccuug  uacccucaag  aaacaguauu  gugggaagaa   8700

gaagacuagg  acaauacucg  gcaccaauaa  cuucauugcg  cuggcucacc  gggcagcguu   8760

gagugguguc  acccagggcu  ucaugaaaaa  ggcguuuaac  ucgcccauug  cccucgguaa   8820

aaacaaauuu  aaagagcuuc  agacuccggu  cuuaggcagg  ugccuugaag  cugaucuugc   8880

auccugcgau  cgcuccacac  cugcaauugu  ccgcugguuu  gccgccaauc  uucuuuauga   8940

acuugccugu  gcugaagagc  accagccguc  guacguguug  aacugcugcc  acgaccuacu   9000

ggucacgcag  uccggcgcag  uaacuaagag  agguggccug  ucgucuggcg  acccgaucac   9060

uucugugucc  aacaccauuu  acagcuuggu  gauauaugca  caacacaugg  ugcucaguua   9120

cuuuaaaagu  ggucacccuc  auggccuucu  guuucuacaa  gaccagcuga  aguuugagga   9180

caugcucaag  guucaacccc  ugaucgucua  uucggacgac  cucguacugu  augccgaguc   9240

ucccaccaug  ccaaacuacc  acuggugggu  ugaacaucug  aaccugaugc  uggguuuuca   9300

gacggaccca  aagaagacag  ccauaacaga  cucgccauca  uuucuaggcu  guaggauaau   9360

aaauggacgc  cagcucgucc  cuaaccguga  caggauucuc  gcggcccucg  ccuaccauau   9420

gaaggcaagc  aaugucucug  aauacuacgc  cucggcggcu  gcgauacuca  uggacagcug   9480

ugcuuguuua  gaguaugauc  ccgaaugguu  ugaagagcuu  guaguuggga  uagcgcagug   9540

ugcccgcaag  gacggcuaca  guuuucccgg  cccgccguuc  uucuugucca  ugugggaaaa   9600

acucagaucc  aaucaugagg  ggaagaaguc  cagaaugugc  ggguacgcg   gggccccggc   9660

uccguacgcc  acugccugug  gccucgacgu  cuguauuuac  cacacccacu  uccaccagca   9720

uuguccaguc  aucaucuggu  guggccaccc  ggcugguucu  gguucuugua  gugagugcaa   9780

accccccua   gggaaaggca  caagcccucu  agaugaggug  uuagaacaag  ucccguauaa   9840

gccuccacgg  acuguaauca  ugcaugugga  gcagggucuc  accccucuug  acccaggcag   9900

auaccagacu  cgccgcggau  uagucuccgu  uaggcguggc  auuagaggaa  augagguuga   9960

ucuaccagac  ggugauuaug  cuagcaccgc  ccuacucccu  acuuguaaag  agauuaacau  10020

ggucgcuguc  gccucuaaug  uguugcgcag  cagguucauc  aucggcccgc  cuggugcugg  10080

gaaaacauac  uggccuuuc   aacaggucca  ggauggugau  gccauuuaca  cgccaacuca  10140

ccagaccaug  cucgauauga  uuagggcuuu  ggggacgugc  cgguucaacg  ucccagcagg  10200

uacgacgcug  caauucccug  cccccucccg  uaccggcccu  uggguucgca  uccuagccgg  10260

cgguuggugu  ccuggcaaga  auuccuuccu  ggaugaagca  gcguauugua  aucaccuuga  10320

ugucuugagg  cuucuuagca  aaacuacccu  caccugucug  ggagauuuca  aacaacucca  10380

cccagugggu  uuugauucuc  auugcuaugu  uuuugacauc  augccucaga  cucaacugaa  10440
```

Page 23

```
gaccaucugg agauuuggac agaauaucug ugaggccauu cagccagauu acagggacaa   10500

acuuguaucc augqucaaca caacccgugu aaccuacgug gaaaaaccug ucaaguaugg   10560

gcaaguccuc accccuuacc acagggaccg agaggacggc gccaucacaa uugacuccag   10620

ucaaggcgcc acauuugaug ugguuacacu gcauuugccc acuaaagauu cacucaacag   10680

gcaaagagcc cuuguugcua uuaccagggc aagacaugcu gucuuugugu augacccaca   10740

caggcaacug cagagcaugu uugaucuucc ugcgaaaggc acacccguca accucgcugu   10800

gcaccgugac gagcagcuga ucgugcuaga uagaaauaac aaagaaugca cgguugcuca   10860

ggcucuaggc aauggggaua aauucagggc cacagacaag cgcguuguag auucucuccg   10920

cgccauuugu gcagaucugg aagggucgag cuccccgcuc cccaaggucg cacacaacuu   10980

gggauuuuau uucucgccug auuugacaca guuugcuaaa cucccgguag aacuugcacc   11040

ccacuggccc guggugacaa cccagaacaa ugaaaagugg ccagaccggu ugguugcuag   11100

ccuucgcccc guccauaagu auagccgcgc gugcaucggu gccggcuaca ugguggggccc   11160

cucaguguuu cugggcaccc cuggggugu gucauacuau cucacaaaau uugucagggg   11220

cgaggcucaa augcuuccgg agacagucuu cagcaccggc cgaauugagg uagauugccg   11280

ugaguaucuc gaugaccggg agcgagaaau ugcugagucc cucccccaug cuuucauugg   11340

cgacgucaaa ggcacuaccg uuggaggaug ucaccauguc accuccaaau accuuccgcg   11400

cuuccuuccc aaggaaucag ucgcgguagu cggggguuuca agccccggga aagccgcaaa   11460

agcaguuugc acauuaacag auguguaucu cccagaucuc gaagcuuacc uccacccaga   11520

gacccagucc aagugcugga aaaugauguu ggacuucaag gaaguucgac ugauggucug   11580

gaaggacaag acggccuauu uucaacuuga aggccgccau uucaccuggu accagcuugc   11640

aagcuaugcc ucguacaucc gaguuccugu uaacucuacg guguauuugg accccugcau   11700

gggcccugcc cuuugcaaca gaagaguugu cggguccacu cauuggggag cugaccucgc   11760

agucacccu uaugauuacg gugccaaaau cauccugucu agugcauacc augqugaaau   11820

gccccugggg uacaaaaucc uggcgugcgc ggaguucucg cuugacgauc cagugaggua   11880

caaacacacc uggggguuug aaucggauac agcguaucug uacgaguuca ccggaaacgg   11940

ugaggacugg gaggauuaca augaugcguu ucgugcgcgc cagaaaggga aaauuuauaa   12000

ggccacugcc accagcauga gguuucauuu uccccggggc ccugucauug aaccaacuuu   12060

aggccugaau ugaaaugaaa uggggguccau gcaaagccuc uuugacaaaa uuggccaacu   12120

uuucguggau gcuuucacgg aauuuuuggu guccauuguu gauaucauca uauuuuuggc   12180

cauuuuguuu ggcuuuacca ucgcuggcug gcuggugguc uucugcaucc gauugguuug   12240

cuccgcggua cuccgugcgc gcccuaccau ucaccugag caauuacaga agauccuaug   12300

aggccuuucu uucucagugc caggugggaua uucccaccug gggaacuaga cauccccugg   12360
                              Page 24
```

```
ggaugcuuug gcaccauaag gugucaaccc ugauugauga aauggugucg cgucggaugu   12420

accgcaccau ggaaaaagca ggacaggcug ccuggaaaca gguggugagc gaggccacgc   12480

ugucucgcau uagugguuug gauguggugg cucauuuuca gcaucuugcc gccauugaag   12540

ccgagaccug uaaauauuug gccucucggc ugcccaugcu acacaaucug cgcaugacag   12600

ggucaaaugu aaccauagug uauaauagua cuuugaauca ggguuuugcu auuuuuccaa   12660

ccccuggauc ccggccaaag cuucaugauu uucagcaaug gcuaauagcu gugcacuccu   12720

ccauauuuuc cuccguugcg gcuucuugua cucuuuuugu ugugcugugg uugcggauuc   12780

caaugcuacg uacuguuuuu gguuuccgcu gguuaggggc aauuuuuccu ucgaacucac   12840

ggugaauuac acggugiguc cgccuugccu cacccggcaa gcagccgcug aggucuacga   12900

accaggcagg ucucuuuggu gcaggauagg gcaugaccga uguagugagg aagaccauga   12960

cgaucuaggg uucaugguuc cgucuggccu cuccagcgaa ggcacuuga ccaguguuua   13020

cgccugguug gcguuccugu ccuucagcua cacggcccag uuccaucccg agauauuugg   13080

gauagggaau gugagucaag uuuauguuga caucaagcac caauucaucu gcgccguuca   13140

cgacggggag aacgccaccu ugccucguca ugacaauauu ucagccguau aucagaccua   13200

cuaccaacau caagucgacg gcggcaauug guuucaccua gaauggcugc gccccuucuu   13260

uuccucuugg uugguuuuaa auguuucuug guuucucagg cguucgccug caagccaugu   13320

uucaguucaa gucuuucgga caucaaaacc aacacaaccg cagcaucagg cuuuguuguc   13380

cuccaggaca ucagcugccu uaggcauggc gacucguccu cucagacgau ucgcaaaagc   13440

ucucagugcc gcgcggcgau agggacgccc guguacauca cugucacagc caaugucaca   13500

gaugagaauu auuuacauuc uucugaucuc cuuaugcuuu cuucuugccu uuucuaugcu   13560

ucugagauga gugaaaaggg auucaaggug auguuuggca augugucagg caucguggcu   13620

guguguguca acuuuaccag cuacguccaa caugucaagg aguuuaccca acgcuccuug   13680

guggucgauc augugcggcu gcuccauuuc augacaccug agaccaugag gugggcaacc   13740

guuuuagccu guuuucuugc caucuuacug gcaauuugaa uguucaagua uguuggggag   13800

augcuugacc gcgggcuguu gcucgcgauu gcuuucuuug ugguguaucg ugccauuuug   13860

uuuugcugcg cucgucaacg ccaacagcaa cagcagcucu caucuucagu uaauuuacaa   13920

cuugacgcua ugugagcuga auggcacaga uuggcugaaa gacaaauuug auugggcauu   13980

ggagacuuuu gucaucuuuc ccguguugac ucacauuguc ucauauagug cacucaccac   14040

uagccauuuc cuugacacag ucggucuggu uacugugucu acgccgggu ucuaccacgg   14100

gcgguauguu cugaguagca ucuacgcggu cugcgcucug gccgcauuga cuugcuucgu   14160

cauuaggcuu gcgaagaacu gcauguccug gcgcuacucu uguaccagau auacuaacuu   14220
```

Page 25

ccuucuggac acuaagggca gacucuaucg cuggcggucg cccguuauca uagagaaagg   14280

ggguaagguu gaggucgaag gucaccugau cgaccucaaa agaguugugc uugaugguuc   14340

cguggcaacc ccuuuaacca gaguuucagc ggaacaaugg ggucgucuuu agacgacuuu   14400

ugcuaugaua gcacggcucc acaaaaggug cuuuuggcgu uuuccauuac cuacacgcca   14460

gugaugauau augcucuaaa gguaagucgc ggccgacuuu uagggcuucu gcaccuuuug   14520

aucuuucuga auuguacuuu uaccuucggg uacaugacau gcgugcacuu uaauagcaca   14580

aauaaggucg cgcucacuau gggagcagua guugcacuuc uuuggggggu guacucagcc   14640

auagaaaccu ggaaguucau caccuccaga ugucguuugu gcuugcuagg ccgcaaguac   14700

auucuggccc ccgcccacca cgucgaaagu gccgcgggcu uucauccgau cgcggcaaau   14760

gauaaccacg cauuugucgu ccggcguccc ggcuccacua cgguuaacgg cacauuggug   14820

cccggguuga aaagccucgu guuggguggc agaaaagcug uuaaacaggg agugguaaac   14880

cuugucaaau augccaaaua acaacggcaa gcagcaaaag aaaaagaggg ggaauggcca   14940

gccagucaau cagcugugcc agaugcuggg uaagaucauc gcccagcaaa accaguccag   15000

aggcaaggga ccggggaaga aaauuaagaa uaaaaacccg gagaagcccc auuuuccucu   15060

agcgacugaa gaugacguca ggcaucacuu caccccuagu gagcggcaau ugugucuguc   15120

gucgauccag acugccuuua accagggcgc uggaaccugu acccaucag auucagguag   15180

gauaaguuac acuguggagu uuaguuugcc gacgcaucau acugugcgcc ugauccgcgu   15240

cacagcgcca ucaucagcgu aaugggcugg cauuccuuaa gcaccucagu guuagaauug   15300

gaagaaugug uggugaaugg cacugauugg cacugugccu cuaagucacc uauucaauua   15360

gggcgaccgu guggggguua aguuuaauug gcgagaacca ugcggccgaa auu   15413

<210> 4

<211> 15413

<212> RNA

<213> Porcine reproductive and respiratory syndrome virus

<400> 4

augacguaua gguguuggcu cuaugccuug gcauuuguau ugucaggagc ugcgaccauu   60

gguacagccc aaaacuagcu gcacagaaaa cgcccuucug ugacagcccu cuucagggga   120

gcuuaggggu cuguccuag caccuugcuu ccggaguugc acugcuuuac ggucucucca   180

acccuuuaac caugucuggg auacuugauc ggugcacgug cacccccaau gccagggugu   240

uuauggcgga gggccaaguc uacugcacac gaugucucag ugcacggucu cuccuuccuc   300

ugaaucucca aguuccugag cuuggagugc ugggccuauu uuacaggccc gaagagccac   360

```
uccgguggac guugccacgu gcauucccca cuguugagug cuccccgcc ggggccugcu      420

ggcuuucugc gaucuuucca auugcacgaa ugaccagugg aaaccugaac uuucaacaaa      480

gaauggugcg ggucgcagcu gagauuuaca gagccggcca gcucaccccu gcagucuuga      540

aggcucuaca aguuuaugaa cgggguugcc gcugguaccc uauagucgga ccuguccug       600

gaguggccgu uuuugccaac ucccuacaug ugagugauaa accuucccg ggagcaacuc       660

augugcuaac caaccugcca cucccgcaga ggccuaagcc ugaagacuuu ugcccuuug       720

agugugcuau ggcugacguc uaugauauug gucauggcgc cgucauguau guggccaaag      780

ggaaagucuc cugggccccu cguggcgggg augaggcgaa auuugaaacu gucccuaggg      840

aguugaaguu gaucgcgaac caacuccaca ucuccuuccc gccccaccac gcaguggaca      900

ugucuaaguu uguguucaua gccccuggga guggugucuc uaugcggguc gagugcccac      960

acggcugucu ccccgcuaau acugucccug aagguaacug cuggguggcgc uuguuugacu     1020

cgcucccacu ggacguucag aacaaagaaa uucgccgugc caaccaauuc ggcuaucaaa      1080

ccaagcaugg ugucgcuggc aaguaccuac aacggaggcu gcaagcuaau ggucuccgag      1140

cagugacuga uacagaugga cccauugucg uacaguauuu cucuguuagg gagagcugga      1200

uccgccacuu cagacuggcg gaagagccua gccucccugg guuugaagac cuccucagaa      1260

uaaggguaga gcccaauacg ucgccauuga gugacaaggg uggaaaaauc uuccgguuug      1320

gcagucacaa augguacggu gcuggaaaga gagcaaggaa agcacgcucu gguaugacca      1380

ccacagucgc ucaccgcgcc uugcccgcuc gugaaaucca gcaagccaaa aagcacgagg      1440

augccggcgc ugauaaggcu gugcaucuca ggcacuauuc uccgccugcc gacgggaacu      1500

gugguuggca cugcauuucc gccaucgcca accgaauggu gaauuccaaa uuugaaacua      1560

cucuucccga gagggugaga ccuucagaug acugggcuac ugacgaggac cuugugaaca      1620

ccauccaaau ucucaagcuc ccugcggccu uggacaggaa cggugcuugu guuggcgcca      1680

aauacgugcu uaagcuggaa ggcgagcauu ggacugcuc ugugacccuu gggauguccc       1740

cuucuuugcu cccccuugaa uguguucagg cuguuguga gcauaagagc ggacuugguc       1800

ccccagaugc ggucgaaguu uucggauuug acccugccug ccuugaccga cuggcugagg      1860

uaaugcacuu gccuagcagu gucaucccag cugcucuggc cgaaaugucc ggcgacccca      1920

acuguccggc uuccccgguc acuacugugu ggacuguuuc acaauucuuu gcccgccaca      1980

gaggaggaga gcacccugau caggugcgcu uaggaaaaau caucagccuu ugucaaguug      2040

uugaggaaug cuguugccau cagaauaaaa ccaaccgggc caccccggaa gagguugcgg      2100

caaggauuga ucaguaccuc cauggugcaa caagucuuga agaaugcuug auuaggcuug      2160

agaggguuug cccgccgagc gcugcggaca ccuucuuuga uuggaauguu gugcucccug      2220
```

Page 27

```
ggguuggggc uucaacucag acaaccaaac agcuccaugu caaccagugc cgcgcucugg    2280

uuccugucgu gacucaagag ccuuuggaca aagacucagu cccucugacc gccuucucgc    2340

uguccaauug cuacuauccu gcacaaggug acgagguucg ucaccgugag aggcuaaacu    2400

ccguacucuc uaagcuggag gggguuguuc gugaggaaua ugggcucacg ccaacugaac    2460

cuggcccgcg acccgcacua ccgaacgggc ucgucgaacu uaaagaccag auggaggagg    2520

aucugcugaa acuagucaac gcccaggcaa cuucagaaau gauggccugg gcagccgagc    2580

agguugaucu gaaagcuugg gucaaaaacu acccacggug acaccgcca cccccuccac    2640

caagaguuca gccucgaaaa acaaagucug ucaagagcuu gccagggaac aaaccugucc    2700

ccgcuccacg caggaagguc agaucugauu guggcagccc gauuuugaug ggcgacaaug    2760

uuccugacgg ucgggaagau uugacuguug guggcccccu ugaucuuucg acaccauccg    2820

agccgaugac accucugagu gagccugcac uuaugcccgc guugcaauau auuucuaggc    2880

cagugacauc uuugagugug cuggccccag uuccugcacc gcguagaacu guguccccgac   2940

cggugacgcc cuugagugag ccaauuuuug ugucugcacc gcgacacaaa uuucagcagg    3000

uggaagaagc gaaucuggcg gcaacaacgc ugacgcacca ggacgaaccu cuagauuugu    3060

cugcauccuc acagacugaa uaugaggcuu cuccccuaac accacugcag aacauggggua   3120

uucuggaggu ggggggggcaa gaagcugagg aaguucgag ugaaaucucg gauacacuga    3180

augacaucaa cccugcaccu gugucaucaa gcagcucccu gucaaguguu aagaucacac    3240

gcccaaaaca cucugcucaa gccaucauug acucgggcgg gcccugcagu gggcaucucc    3300

gaagggaaaa agaagcaugc cucagcauca ugcgugaggc uugugaugcg gcuaagcuua    3360

gugacccugc cacgcaggaa uggcuuucuc gcaugugggga uaggguugac augcugacuu    3420

ggcgcaacac gucugcuuac caggcguucc gcaucuuaga ugguagguuu gaguuucucc    3480

caaagaugau acucgagaca ccgccgcccu acccgugugg guuugugaug cugccucaca   3540

cgccugcacc uuccgugggu gcagagagug accuuaccau ugguucaguc gccacugaag    3600

auguuccacg cauccucggg aaaauagaaa acgccggcga gaugcccaac caggggcucu    3660

ugacauccuu cggggaagaa ccggugugcg accaaccugu caaggacucc uggaugucgu    3720

cgcggggguu ugacgagagc acaacggcuc cguccgcugg uacagguggu gcugacuuac    3780

ccaccgauuu gccaccuuca gaugguuugg augcggacga guggggggccg uuacggacgg    3840

uaagaaagaa agcugaaagg cucuucgacc aauugagccg ucagguuuuu aaccucgucu    3900

cccaucuccc uguuuucuuc ucacaccucu ucaaaucuga cagugguuau ucuccggggug   3960

auuggggguuu ugcagcuuuu acuuuauuuu gccucuuuuu guguuacagc uacccauucu    4020

uugguuuugu uccccucuug ggguguuuuu cugggucuuc ucggcgugug cgcauggggg    4080

uuuuuggcug uugguuggcu uuugcguuug gccuguucaa gccugugucc gacccagucg    4140
```
Page 28

```
gcacugcuug ugaguuugac ucgccagagu guaggaacgu ccuucauucu uuugagcuuc    4200

ucaaaccuug ggacccuguu cgcagccuug uuguggggccc cgucggucuc ggccuugcca    4260

uucuuggcag guuacgggc gggggcacgcu acaucuggca uuuuuugcuu aggcuuggca    4320

uuguugcaga uuguaucuug gcuggagcuu augugcuuuc ucaagguagg uguaaaaagu    4380

gcuggggauc uuguguaaga acugcuccua augaaaucgc cuucaacgug uucccuuuua    4440

cgcgugcgac caggucguca cucaucgacc ugugcgaucg guuuugugcg ccaaaaggca    4500

uggaccccau uuuccucgcu acgggguggc gcgggugcug gaccggccga agucccauug    4560

agcaacccuc ugaaaaaccc aucgcguucg cccaguugga ugaaaagagg auuacggcua    4620

gaacuguggg cgcucagccu uaugauccua accaagccgu aaagugcuug cggguguuac    4680

aggcgggugg ggcgauagug gccgaggcag ucccaaaagu ggucaagguu uccgcuauuc    4740

cauuccgagc ucccuuuuuu cccaccggag ugaagguuga uccugagugc aggaucgugg    4800

ucgaccccga cacuuuuacu acagcucucc ggucugguua cuccaccaca aaccucgucc    4860

uuggguguggg ggacuuugcc caacugaaug gauuaaaaau caggcaaauu uccaagcccu    4920

cgggaggagg cccgcaccuc auugcugccc ugcauguugc uugcucgaug gcguugcaca    4980

ugcuugcugg aguuuaugua acugcagugg ggucuugcgg uaccggcacc aacgauccgu    5040

ggugcacuaa cccauucgcc gucccuggcu acggaccugg cucccucugc acguccagau    5100

ugugcaucuc ccaacauggc cuuacccugc ccuugacagc acuuguggca ggauucgguc    5160

uucaggaaau ugcccuaguc guuuugauuu ucguuuccau cggaggcaug gcucauaggu    5220

ugaguuguaa ggcugauaug cugugcgucu uacuugcaau cgccagcuau guuuggguac    5280

cccuuaccug guugcucugu guguuuccuu gcugguugcg cugguucucu uugcacccuc    5340

ucaccauucu augguuggug uuuuucuuga ugucuguaaa uaugccuucg ggaaucuuaa    5400

ccgguggguu auggguugcu cuuuggcuuc uaggccguua uacuaauguu guuggucuug    5460

uuaccccua ugauauucau cauuacacca auggccccg cggguuugcc gccuuggcua    5520

ccgcaccaga ugggacuuac uuggccgcug uccgccgcgc ugcguugacu ggccgcaccg    5580

ugcuguuuac cccgucucag cuuggguccc uucuugaggg cgcuuucaga acucgaaagc    5640

ccucacugaa caccgucaau guggucgggu ccuccauggg cucuggcgga uguucacua    5700

ucgaugggaa aauuaagugc gugacugccg cacauguccu uacggguaau ucagccaggg    5760

uuuccggggu cggcuucaau caaaugcuug acuuugaugu aaaaggggac uucgccauag    5820

cugauugccc gaauuggcaa ggggcugcuc cuaagaccca auucugcgag gauggaugga    5880

cuggccgcgc cuauuggcug acauccucug cgucgaacc cgguguauu gggaauggau    5940

ucgccuucug cuucaccgcg ugcggcgauu ccggguccc agugaucacc gaagccggug    6000
```

Page 29

```
agcuugucgg cguucacaca ggaucaaaca aacaaggagg aggcauuguu acgcgccccu    6060

cuggccaguu uugcaaugug gcacccauca agcugagcga auuaagugag uucuuugcug    6120

gaccuaaggu cccgcucggu gaugugaagg uuggcagcca cauaauuaaa gacauaugcg    6180

agguaccuuc agaucuuugc gccuugcuug cugccaaacc cgaacuggaa ggaggccucu    6240

ccaccgucca acuucugugu guguuuuucc uccuguggag aaugauggga caugccugga    6300

cgcccuuggu ugcuguuggg uuuuuuaucu ugaaugaggu ucucccagcu guacuggucc    6360

ggaguguuuu cuccuuugga auguuugugc uaucuuggcu cacaccaugg ucugcgcaag    6420

uucugaugau caggcuucua acagcagcuc uuaacaggaa cagauuguca cucgccuuuu    6480

acagccuugg ugcagcgacc gguuuugucg cagaucuggc ggcaacucaa gggcacccgu    6540

ugcaggcagu aaugaauuua aguaccaug ccuuccugcc ucggauaaug gucgugaccu     6600

caccaguccc agugauugcg ugugguguug ugcaccuccu ugccauaauu uuguacuugu    6660

uuaaguaccg cugccugcac aaauguccuug uuggcgaugg ugcguucucu gcggcuuucu    6720

ucuugcgaua cuuugccgag gggaaauuga gggaaggggu gucgcaaucc ugcgggauga    6780

aucaugaguc gcugacuggu gcccucgcua ugagacuuaa ugacgaggac uuggauuuuc    6840

uuacgaaaug gacugauuuu aaguguuuug uuucugcauc caacaugagg aaugcggcgg    6900

gccaguucau cgaggcugcc uaugcuaaag cacuuagaau ugaacuugcc caguuggugc    6960

agguugauaa gguucgaggu acuuuggcca aacugaagc uuuugcugau accguggcac     7020

cccaacucuc gccggugac auuguuguug cucuuggcca uacgccuguu ggcgguaucu     7080

ucgaccuaaa gguugguagc accaagcaua cccuccaagc cauugagacc agaguucuug    7140

ccggguccaa aaugaccgug gcgcguucg uugauccaac ccccacaccc cacccgcac      7200

ccgugccuau ccccccuucca ccgaaaguuc uggagaaugg ucccaacgcc uggggggaug    7260

aggaucguuu gaauaagaag aagaggcgca ggauggaagc cgucggcauc uuuguuaugg    7320

guggaaagaa auaucagaaa uuuugggaca agaacuccgg ugauguguuu uaugaggagg    7380

uccaugauaa cacagacgcg ugggagugcc ucagaguuga caacccugcc gacuuugacc    7440

cugagaaggg aacucugugc gggcauacua ccauugaaga uaagacuuac agugucuacg    7500

ccuccccauc uggcaagaaa uuccuggucc ccgucacccc agagagcaaa aaaaaccaau    7560

gggaagcugc gaagcuuucc guggaacagg cccuuggcau gaugaauguc gacggugaac    7620

ugacagccaa agaaguggag aaacugaaaa gaauaauuga caaacuccag ggccugacua    7680

aggagcagug uuuaaacugc uagccgccag cggcuugacc cgcugugguc gcggcggcuu    7740

gguuguuacu gagacagcgg uaaaaauagu caaauuucac aaccggaccu ucacccuagg    7800

accugugaau uuaaaagugg ccagugaggu ugagcuaaaa gacgcggucg agcauaacca    7860

acacccgguu gcaagaccgg uugauggugg uguugugcuc cugcgcuccg caguuccuuc    7920
```
Page 30

```
gcuuauagac gucuuaaucu ccggcgcuga ugcaucuccc aaguuacucg cccgccacgg    7980

gccgggaaac acugggaucg auggcacgcu uugggauuuu gaggccgagg ccacuaaaga    8040

ggaaauugca cucagugcgc aaauaauaca ggcuugugac auuaggcgcg gcgacgcacc    8100

ugaaauuggu cuuccuuaua agcuguaccc ugucaggggc aacccugagc ggguaaaagg    8160

aguuuuacag aauacaaggu uuggagacau accuauaaa accccagug acacuggaag      8220

cccagugcac gcggcugccu gccucacgcc caaugccacu ccggugacug augggcgcuc    8280

cgucuuggcc acgacuaugc ccuccgguuu ugaguuguau guaccgacca uuccagcguc    8340

uguccuugau uaucuugauu cuaggccuga cugccccaaa caguugacag agcacggcug    8400

ugaggacgcc gcauuaagag accucuccaa guaugacuug uccacccaag gcuuuguuuu    8460

accuggaguu cuucgccuug ugcguaagua ccguuuugcu caugugggua agugcccgcc    8520

cguucaucgg ccuuccacuu acccugccaa gaauucuaug gcugggaauaa augggaacag   8580

guuuccaacc aaggacaucc agagcguccc ugaaaucgac guucugugcg cacaggccgu    8640

gcgggaaaac uggcaaacug uuaccccuug uacccucaag aaacaguauu gugggaagaa    8700

gaagacuagg acaauacucg gcaccauaa cuucauugcg cuggcccacc gggcagcguu     8760

gaguggguc acccagggcu ucaugaaaaa ggcguuuaac ucgcccauug cccucgguaa     8820

aaacaaauuu aaagagcuuc agacuccggu cuuaggcagg ugccuugaag cugaucuugc    8880

auccugcgau cgcuccacac cugcaauugu ccgcugguuu gccgccaauc uucuuuauga    8940

acuugccugu gcugaagagc accugccguc guacguguug aacugcugcc acgaccacu     9000

ggucacgcag uccggcgcag uaacuaagag agguggccug ucgucuggcg acccgaucac    9060

uucuguguucc aacaccauuu acagcuuggu gauauaugca caacacaugg ugcucaguua   9120

cuuuaaaagu ggucacccuc auggccuucu guuucuacaa gaccagcuga aguuugagga    9180

caugcucaag guucaacccc ugaucgucua uucggacgac cucguacugu augccgaguc    9240

ucccaccaug ccaaacuacc acuggugggu ugaacaucug aaccugaugc uggguuuuca    9300

gacggaccca aagaagacag ccauaacaga cucgccauca uuucuaggcu guaggauaau    9360

aaauggacgc cagcucgucc cuaaccguga caggauucuc gcggcccucg ccuaccauau    9420

gaaggcaagc aaugucucug aauacuacgc cucggcggcu gcgauacuca uggacagcug    9480

ugcuuguuua gaguaugauc ccgaaugguu ugaagagcuu guaguuggga uagcgcagug    9540

ugcccgcaag gacggcuaca guuucccgg cccgccguuc uucuugucca ugugggaaaa     9600

acucagaucc aaucaugagg ggaagaaguc cagaaugugc gggguacgcg gggccccggc    9660

uccguacgcc acugccugug gccucgacgu cuguauuuac cacacccacu uccaccagca    9720

uuguccaguc aucaucuggu guggccaccc ggcugguucu gguucuugua gugagugcaa    9780
```

```
accccccua gggaaaggca caagcccucu agaugaggug uuagaacaag ucccguauaa   9840

gccuccacgg acuguaauca ugcaugugga gcagggucuc accccucuug acccaggcag   9900

auaccagacu cgccgcggau uagucuccgu uaggcguggc auuagaggaa augagguuga   9960

ucuaccagac ggugauuaug cuagcaccgc ccuacucccu acuuguaaag agauuaacau  10020

ggucgcuguc gccucuaaug uguugcgcag cagguucauc aucggcccgc cuggugcugg  10080

gaaaacauac uggcuccuuc aacaggucca ggauggugau gucauuuaca cgccaacuca  10140

ccagaccaug cucgauauga uuagggcuuu ggggacgugc cgguucaacg ucccagcagg  10200

uacgacgcug caauucccug ccccucuccg uaccggcccu uggguucgca uccuagccgg  10260

cgguuggugu ccuggcaaga auuccuuccu ggaugaagca gcguauugua aucaccuuga  10320

ugucuugagg cuucuuagca aaacuacccu caccugucug ggagauuuca aacaacucca  10380

cccagugggu uuugauucuc auugcuaugu uuuugacauc augccucaga cucaacugaa  10440

gaccaucugg agauuuggac agaauaucug ugaugccauu cagccagauu acagggacaa  10500

acuuguaucc auggucaaca caacccgugu aaccuacgug gaaaaaccug ucaaguaugg  10560

gcaaguccuc accccuuacc acagggaccg agaggacggc gccaucacaa uugacuccag  10620

ucaaggcgcc acauuugaug ugguuacacu gcauuugccc acuaaagauu cacucaacag  10680

gcaaagagcc cuuguugcua uuaccagggc aagacaugcu aucuuugugu augacccaca  10740

caggcaacug cagagcaugu uugaucuucc ugcgaaaggc acaccgguca accucgcugu  10800

gcaccgugac gagcagcuga ucgugcuaga uagaaauaac aaagaaugca cgguugcuca  10860

ggcucuaggc aaugggggua aauucagggc cacagacaag cgcguuguag auucucuccg  10920

cgccauuugu gcagaucugg aagggucgag cuccccgcuc cccaaggucg cacacaacuu  10980

gggauuuuau uucucgccug auuugacaca guuugcuaaa cucccgguag aacuugcacc  11040

ccacuggccc guggugacaa cccagaacaa ugaaaagugg ccagaccggu ugguugcuag  11100

ccuucgcccc guccauaagu auagccgcgc gugcaucggu gccggcuaca uggugggccc  11160

cucaguguuu cugggcaccc cugggguugu gucauacuau cucacaaaau uugucagggg  11220

cgaggcucaa augcuuccgg agacagucuu cagcaccggc cgaauugagg uagauugccg  11280

ugaguaucuu gaugaccggg agcgagaaau ugcugagucc cuccccaug cuuucauugg  11340

cgacgucaaa ggcacuaccg uuggaggaug ucaccauguc accuccaaau accuuccgcg  11400

cuuccuuccc aaggaaucag ucgcgguagu cggggguuuca agccccggga aagccgcaaa  11460

agcaguuugc acauuaacag auguguaucu cccagaucuc gaagcuuacc uccacccaga  11520

gacccagucc aagugcugga aaaugauguu ggacuucaag gaaguucgac ugauggucug  11580

gaaggacaag acggccuauu uucaacuuga aggccgccau uucaccgguu accagcuugc  11640

aagcuaugcc ucguacaucc gaguuccugu uaacucuacg guguauuugg accccugcau  11700
```

```
gggcccugcc cuuugcaaca gaagaguugu cggguccacu cauuggggag cugaccucgc 11760

agucaccccu uaugauuacg gugccaaaau cauccugucu agugcauacc augguugaaau 11820

gcccccuggg uacaaaaucc uggcgugcgc ggaguucucg cuugacgauc cagugaggua 11880

caaacacacc uggggguuug aaucggauac agcguaucug uacgaguuca ccggaaacgg 11940

ugaggacugg gaggauuaca augaugcguu ucgugcgcgc cagaaaggga aaauuuauaa 12000

ggccacugcc accagcauga gguuucauuu uccccgggc ccugucauug aaccaacuuu 12060

aggccugaau ugaaaugaaa uggggguccau gcaaagccuc uuugacaaaa uuggccaacu 12120

uuuuguggau gcuuucacgg aauuuuuggu guccauuguu gauaucauca uauuuuuggc 12180

cauuuuguuu ggcuuuacca ucgcuggcug gcuggugguc uucugcaucc gauugguuug 12240

cuccgcggua cuccgugcgc gcccuaccau ucacccugag caauuacaga agauccuaug 12300

aggccuuucu uucucagugc cagguggaua uucccaccug gggaacuaga caucccugg 12360

ggauguuuug gcaccauaag gugucaaccc ugauugauga aaugguugucg cgucggaugu 12420

accgcaccau ggaaaaagca ggacaggcug ccuggaaaca gguggugagc gaggccacgc 12480

ugucucgcau uagugguuug gauguggugg cucauuuuca gcaucuugcc gccauugaag 12540

ccgagaccug uaaauauuug gccucucggc ugcccaugcu acacaaucug cgcaugacag 12600

ggucaaaugu aaccauagug uauaauagua cuuugaauca ggguguuugcu auuuuuccaa 12660

ccccuggauc ccggccaaag cuucaugauu uucagcaaug gcuaauagcu gugcacuccu 12720

ccauauuuuc cuccguugcg gcuucuugua cucuuuuugu ugugcugugg uugcggauuc 12780

caauacuacg uacuguuuuu gguuuccgcu gguuaggggc aauuuuuccu ucgaacucac 12840

ggugaauuac acggugugc cgccuugccu cacccggcaa gcagccgcug aggucuacga 12900

accaggcagg ucucuuuggu gcaggauagg gcaugaccga uguagugagg acgaccauga 12960

cgaucuaggg uucaugguuc cgccuggccu cuccagcgaa ggccacuuga ccaguguuua 13020

cgccugguug gcguuccugu ccuucagcua cacggcccag uuccaucccg agauauuugg 13080

gauagggaau gugagucaag uuuauguuga caucaagcac caauucaucu gcgccguuca 13140

cgacggggag aacgccaccu ugccucguca ugacaauauu ucagccguau uucagaccua 13200

cuaccaacau caagucgacg gcggcaauug guuucaccua gaauggcugc gccccuucuu 13260

uuccucuugg uugguuuuaa auguuucuug guuucucagg cguucgccug caagccaugu 13320

uucaguucaa gucuuucgga caucaaaacc aacacuaccg cagcaucagg cuuuguuguc 13380

cuccaggaca ucagcugccu uaggcauggc gacucguccu cucagacgau ucgcaaaagc 13440

ucucagugcc gcgcggcgau agggacgccc guguacauca cugucacagc caaugucaca 13500

gaugagaauu auuuacauuc uucugaucuc cuuaugcuuu cuucuugccu uuucuaugcu 13560
```

Page 33

```
ucgagauga gugaaaaggg auucaaggug auauuuggca augugucagg caucguggcu 13620

gugugguca acuuuaccag cuacguccaa caugucaagg aguuuaccca acgcuccuug 13680

guggucgauc augugcggcu gcuccauuuc augacaccug agaccaugag gugggcaacc 13740

guuuuagccu guuuuuuugc caucuuacug gcaauuugaa uguucaagua uguuggggag 13800

augcuugacc gcgggcuguu gcucgcgauu gcuuucuuug ugguguaucg ugccauuuug 13860

uuuugcugcg cucgucaacg ccaacagcaa cagcagcucu caucuucagu ugauuuacaa 13920

cuugacgcua ugugagcuga auggcacaga uuggcugaaa gacaaauuug auuggggcagu 13980

ggagacuuuu gucaucuuuc ccguguugac ucacauuguc ucauauggug cacucaccac 14040

uagccauuuc cuugacacag ucggucuggu uacugugucu accgccgggu ucuaccacgg 14100

gcgguauguu cugaguagca ucuacgcggu cugcgcucug gccgcauuga uuugcuucgu 14160

cauuaggcuu gcgaagaacu gcauguccug gcgcuacucu uguaccagau auacuaacuu 14220

ccuucggac acuaagggca gacucuaucg cuggcggucg cccguuauca uagagaaagg 14280

ggguaagguu gaggucgaag gucaccugau cgaccucaaa agaguugugc uugaugguuc 14340

cguggcaacc ccuuuaacca gaguuucagc ggaacaaugg ggucgucuuu agacgacuuu 14400

ugcuaugaua gcacggcucc acaaaaggug cuuuuggcgu uuuccauuac cuacacgcca 14460

gugaugauau augcucuaaa gguaagcgc ggccgacuuu uagggcuucu gcaccuuuug 14520

aucuuucuga auuguacuuu uaccuucggg uacaugacau ucgugcacuu uaauagcaca 14580

aauaaggucg cgcucacuau gggagcagua guugcacuuc uuuggggggu guacucagcc 14640

auagaaaccu ggaaguucau caccuccaga ugccguuugu gcuugcuagg ccgcaaguac 14700

auucuggccc ccgcccacca cgucgaaagu gccgcgggcu uucauccgau cgcggcaaau 14760

gauaaccacg cauuugucgu ccggcguccc ggcuccacua cgguuaacgg cacauuggug 14820

cccggguuga aaagccucgu guuggguggc agaaaagcug uuaaacaggg aguggguaaac 14880

cuugucaaau augccaaaua acaacggcaa gcagcaaaag aaaaagaggg ggaauggcca 14940

gccagucaau cagcugugcc agaugcuggg uaagaucauc gcccagcaaa accaguccag 15000

aggcaaggga ccggggaaga aaauuaagaa uaaaaacccg agaagcccc auuuuccucu 15060

agcgacugaa gaugacguca ggcaucacuu caccccuagu gagcggcaau ugugucuguc 15120

gucgauccag acugccuuua accagggcgc uggaaccugu acccaucag auucagguag 15180

gauaaguuac acuuggagu uuaguuugcc gacgcaucau acugugcgcc ugauccgcgu 15240

cacagcgcca ucaucagcgu aaugggcugg cauuccuuaa gcaccucagu guuagaauug 15300

gaagaaugug uggugaaugg cacugauugg cacgugccu cuaagucacc uauucaauua 15360

gggcgaccgu guggggguua aguuuaauug gcgagaacca ugcggccgaa auu 15413
```

Page 34